The Builder.

VOL. XXXVII. No. 1901. SATURDAY, AUGUST 16, 1879.

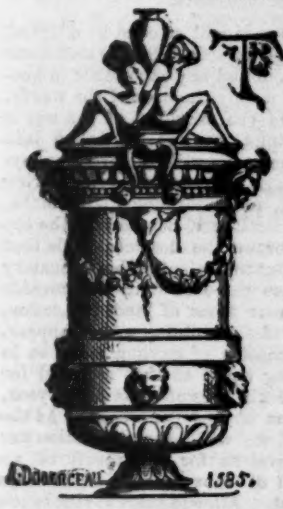
ILLUSTRATIONS.

Town-hall and Public Offices, Barrow-in-Furness.—Mr. W. H. Lynn, Architect 914
Plans of Barrow-in-Furness Town-hall and Public Offices 915
Limburg-on-the-Lahn, Germany (Double-page Lithograph).

CONTENTS.

The House of Lords, the Rookery Owners, and the Public..... 903
Gloucester County Lunatic Asylum 907
What we Learn from the Board of Trade Railway Returns for 1879 908
From the Banks of the Seine 909
Public Health in Cork 910
Epping Forest and Forest Trees 910
Limburg-on-the-Lahn 911
New Conservative Club Buildings, Prestwich 912
Flitcroft's Monument 912
Town-hall and Public Offices, Barrow-in-Furness..... 913
The Art-Union of London 915
The Strand: Then and Now..... 915
The Yarmouth Meeting of the British Archæological Association..... 917
The Royal Archæological Institute at Taunton..... 918
Crystal Palace School of Engineering 919
"An Incredible Story" 920
Asphalte, and its Application to Street Paving..... 920
The Architectural Association at Wells 921
The London Salvage Corps 922
Monastery at Erdington..... 923
Association for the Reform and Codification of the Law of Nations 923
Competitions 926
Candidates successful for the Whitworth Scholarships, 1879 926
The Dome of the Rock 924
"Extra-" in the New Theatre, Plymouth..... 924
Value of Sanitary Works 924
Light Case: Doig v. Gams 926
Books: Buckton's Town and Window Gardening (Longmans); Variorum..... 926
Miscellanea 926

The House of Lords, the Rookery-owners, and the Public.



THE discussion in the House of Lords on the Artisans and Labourers' Dwellings Act was doubly interesting, not only from the facts which it put on record, and from the opinions which it elicited, but also as showing how far the attention of the members of the Legislature has been directed to the question of sanitary improvement, including, under that title, the financial as well as the hygienic elements of the case. The Earl of Camperdown called the attention of their Lordships to the "enormous pecuniary loss already incurred by the Metropolitan ratepayers in carrying out the Artisans and Labourers' Dwellings Act of 1875; and especially noticed the declaration of the chairman of the Metropolitan Board of Works to the effect that it was impossible to estimate the cost to which the ratepayers might be put under that Act. Seven-eighths of the sums already expended, the noble Earl said, had been lost; the schemes already carried out having incurred a loss of half a million sterling. Further schemes had received Parliamentary sanction, involving an equal amount of cost, and presumably of loss, and it was contemplated as a possible result that the ratepayers of the Metropolis may be put to a cost of two millions of money in order to provide sites for the dwellings of artisans.

The motive of Lord Camperdown's speech was very decidedly in accordance with the remarks which we ourselves ventured to offer on the same subject, which had excited a considerable degree of public attention before it was thus brought before the House of Lords. It was the contention of the noble Earl that the effect of the Act of 1875 had been to encourage a trade in houses that were unfit for human habitation; and that if the vestries had duly enforced the provisions of the Nuisances Removal Act, it might have proved unnecessary to pass the Artisans' Dwellings Act. As an instance of the want of due provision in defence of the public interest, from the ratepaying point of view, Lord Camperdown stated that while the estimates of the Metropolitan Board of Works, so late as December last, had amounted to 285,000*l.* for six schemes, the actual cost had been as much as 562,000*l.*, or very nearly double the estimate. Assuming the correctness of this statement, and further assuming that there is no *per contra* hereafter to be carried to account, such a case of discrepancy between promise and performance would beat the wildest vagaries of the estimates of railway engineers in the palmy days of railway-making.

Earl Beauchamp took up the opposite (but by no means contradictory) view of the case, and referred to the importance of reducing rates of another kind, namely, death-rates and disease-rates, which he regarded as diminished by the operation of the Artisans' Dwellings Act. It was impossible, the noble Earl remarked, to acquire the sites occupied by fever dens and plague spots without incurring considerable expense. The property to which the Act applied was often held in the most complicated way, and it was impossible to settle the question of compensation on any simple method. It was the object of the Act of 1875 to prevent a fancy value being put on property of this description, and to reduce the expense that might have been incurred under the provisions of the Nuisances Removal Act. Lord Beauchamp stated that the results of the operation of the Artisans' Dwellings Act in the metropolis had been the displacement of 11,000 of the working classes, and the providing sites for the accommodation of 11,500 individuals.

Earl Granville pointed out that there was no essential antagonism in the views of the two preceding speakers; but urged that nothing could be more fatal than to allow so large an expenditure as that which was being carried out in the application of the Artisans' Dwellings Act to be borne by the ratepayers of the metropolis. How the difficulty which we have already pointed out could be met, was not suggested by Lord Granville. The different desiderata are irreconcileable. First, it is urged that the sites of abodes unfit for human habitation must be cleared, and that at a large money cost, because of the highly-lucrative character of the class of property. We may have little sympathy with the owners, but we cannot confiscate an income which we have allowed thus gradually to increase to an inordinate amount. Secondly, to put on the ground a building corresponding to the cost of the land, will be, in many cases, if not in all, prohibitory of building artisans' dwellings thereon. Thirdly, this loss, thus incurred, must fall on some one. The question is, on whom?

Lord Beaconsfield observed that the Government had given notice of an Act to amend the Artisans' Dwellings Act; and that it was extremely difficult, from the largeness and novelty of the subject, "to bring forward at once an altogether perfect measure." It was found that the machinery provided by the Nuisances Removal Act could not effect the large changes which seem necessary. Under that Act it was possible to deal with houses, but not with areas. The expense was increased by compensation being necessary, not only for the owners of the property which was the hot-bed of disease, but for those neighbouring proprietors whose property had to be expropriated as part of the scheme. Lord Beaconsfield did not believe that there was any measure ever brought forward that was more desired by the country, more approved by it, or more completely effectual in its object of the improvement of the sanitary condition and health of the people; and he looked forward to the experience to be gained in the carrying out of the measure for enlightenment as to further legislation. This, from a statesman's point of view, is eminently reasonable. But the subject is one on which the builder is more at home than the legislator. No amount of experience can remove the discrepancy between the three requirements of sanitary improvement, provision of accommodation for, at least, an equal number of persons with those displaced for the object of that improvement; and doing so at a rent that shall come within the capacity of the tenant. The very first contention on the part of the sanitary reformer is, that the people are too closely packed. The decay and dilapidation of the houses we demolish aggravate, but do not cause, the evil. The only protest for urging that an equal number of persons per acre can be accommodated in suitable rooms, by demolishing those that are unsuitable, must be based on the assumption that by a more substantial style of building a greater number of vertical planes of abode can be obtained. We do not say that there is no gain in such a change, but if the density per acre remain the same, an element of anxiety still remains.

The Home Secretary gave an illustration of that unconscious humour which so often leads men to teach that they are wiser than their neighbours owing to their use of the simple process of shutting one eye. A respectable-looking man came to the office of the Home Secretary to draw his attention to a point which he thought he had overlooked. The visitor had invested his savings in house-property, which paid him an enormous interest, and which it was proposed to sweep away under the Act. "I cannot afford to lose my interest," said the investor. Here we see one view so simply and straightforwardly held, that the contrary view seemed to be simply an error. "What! stop my rental! Why the Government cannot know how much it is." To reply that its undue amount was the very gravamen of the charge would seem very bitter irony to such a proprietor. Nor can it be denied that on the view of the political economists pure and simple (who ride their theories to death), the rookery-owner had the best of it. He carried out the great law of demand and supply, and he provided in the cheapest way what he sold in the dearest market. As a political economist, in action he was not only unblameable but highly meritorious. "The people want cheap lodging; I can give them cheap lodging. On the principle that many a little makes a mickle, I can so utilise the area of my property as to accommodate four human beings where other people would only accommodate one. I force no one to take my rooms,—or dens, if you choose to call them so. I could let twice the number of

fractions of rooms if I had them to let. The demand, in this particular locality, is very brisk; I keep up a brisk supply. You talk to me of health and all those things in which I take no interest whatever. As a political economist I have one duty to perform to myself and to the public, and only one,—that is, to make the best of my capital. If, therefore, you touch my houses you must leave me an income equal to that which I enjoy. I don't know anything about an architect's valuation, and I don't care. A hundred a year is a hundred a year, and if you take that from me in one way, you must give it to me in another way!"

Now it is quite true that, from a loftier standpoint, the statesman, or the sanitary engineer, sees that the arguments of the rookery-keeper, however good in themselves, do not exhaust the subject. But this is the whole quarrel between those who take our view of the case and the thoroughgoing political economists. *Salus publici suprema lex* is a good motto; and, as far as the individual in question is concerned, it applies. For it is by no means an imaginary case that the desire to crowd the greatest number of lodgers on a given site may be so industriously carried out that lodgers, and proprietors to boot, may be swept off by resulting illness. Our friend who called on Mr. Cross would be loth to believe this possible, but if he were down on his back in bed he would believe it too late. To him the personal question is *the* question. To us the personal question is subordinate. We say, there is danger of fever, and certainty of damage to health. Where the blow falls matters little from our point of view. We say, prevent it altogether.

Here come in two questions, neither of which has yet, so far as we are aware, received anything like the proper amount of discussion. The first is, looking at the subject as a whole, is that mode of dealing with property of a low description "by areas," for which Lord Beaconsfield takes credit as a new method, introduced by the Artisans' Dwellings Act, practically the best?

The second is,—is the replacing of old houses that contained 11,000 inmates, by new ones that hold 11,500 inmates, a permanent advantage to the locality? And, if so, is it an advantage at all commensurate with the cost at which it has been attained?

Leaving the question of money aside, it may be easy to show that to clear away a mass of complicated house property, some of which may be very bad, and the rest of various degrees of excellence, or of the absence of excellence, is what the architect and the sanitary engineer would alike desire. That we quite allow. But then, unfortunately, it is not possible to leave the question of money aside, without great absurdity. We can do pretty much what we like if money is unstinted. A couple of millions sterling is a large sum. We may take it as equivalent to a perpetual burden of 100,000*l.* per annum imposed on the ratepayers. It is, therefore, essential to ask if an equal amount of public service cannot be secured by a less costly method.

It must be remembered that the figures quoted are very large. Three acres is an appreciable portion of an urban area. But four thousand souls is a much more appreciable portion of the metropolitan population. Three acres are only a 26,000th part of the area of the London of the Registrar-General (77,997 acres). But 4,000 persons are the 750th part of the population of that area, taking it roughly as three millions of souls. To pack 4,000 persons on three acres is a terrible effort, regarded from a sanitary point of view. It is a density of 1,333 souls per acre,—the density of Shoreditch being 200, that of Holborn 210, and that of St. Giles 220 souls per acre. We have been lately regarding the question of the amount of heat liberated by the human organism. We have more than the heating power of half a ton of coals per diem liberated by that population. We get a centre of vitiation which is not only intense, but very large. It is an area of, as we said before, very appreciable extent, six times as densely packed as the average of the densest districts in London. Is that a state of things which it is desirable to perpetuate, and to perpetuate at an enormous cost?

How are we to be assured that, after the expenditure of 120,000*l.* per acre per site, and (if we allow 50*l.* per head) a further expenditure of 66,660*l.* per acre for building, the new abodes shall not, in another ten or twenty years, be as unhealthy as those they have displaced? There can be but one reply to that question. Such security, if attainable at all, is only attainable by the introduction of an efficient machinery of supervision. To this, then, we must come. Why not try it in the first instance? When we once recognise the fact that, when a certain density of population is reached the public safety demands the organisation of a sanitary police, we have some daylight thrown on the subject. On the one hand we are compelled to admit that an outlay of 186,660*l.* per acre will give us no safety from the diseases arising primarily from overcrowding, without new police arrangements. On the other hand, it is open to inquire,—what would be the effect of the application of these arrangements to spots now possessing such endangering density, before we talk of buying and of demolition?

It is, we think, undeniable, that it is quite within the limits of possibility that so large an expenditure of the ratepayers' money will not, by itself, effect any very material change in the source of public danger, without supervision; we can see no reason why it should. It may be said that the supervision will be exerted by the builders, the Peabody trustees, or any one else. Be it so. All that we say is that supervision will be essential. It will, no doubt, require sooner or later, to be made imperative by Act of Parliament. Why not try it before we lay out sums of the magnitude above indicated?

The fact is, to put the matter in the plainest terms, that all over England a fight is going on between public good and private greed. The Artisans' Dwellings question is only a part of the whole case. The River Pollution question is one that perhaps is even more of a public scandal; Mining supervision, Factory supervision, School Board supervision, are all parts of the same movement. Our population has become so dense that we have at last admitted, in principle, that even the grand desideratum of individual liberty must yield to the public welfare. We deny to a man the right to bring up his children untaught, even although, like Sir Anthony Absolute, he may have the strongest conviction as to the mischief of teaching people to read. We stop another man from throwing his refuse into the stream that runs through his own land, because we say that he has no right to pollute the rivers, which are meant for the public good. In the same way we have the right,—and Parliament has declared that such is the case,—to go to a private individual and say, "I see an unusual number of persons going into your house. They seem to sleep there. I must come in, and see that they are not so ill accommodated as to be liable to mischief. Your house must not become a hot-bed of fever, and, if you choose to make it so far a public house, I shall come in any night and see that you give proper facilities for the health and decency of your inmates."

But with this supervision, the lucrative occupation of the rookery-keeper would be gone. The demand for enormous compensation would be gone too. The tables would be turned. "You are making," the law would say to the lodging-owner, ¡" cent. per cent. on your capital. That I have no wish to interfere with, but you shall not pack lodgers like pigs. Your income and expenditure are one thing,—the use you make of your house, as an abode for lodgers, is another. With the first thing I have no concern; with the second I have a very lively concern. Put your house in order, or I shall do so for you, and at your expense."

It may be said this is harsh; but the question is, is it just? If it is not, we must reverse all our late legislation, which is based on the principle of restricting private liberty when it causes public mischief. If it is, we have begun at the wrong end, by the attempt to deal with areas, at enormous cost. We ought to have begun with the removal of nuisances. Slackness in dealing with admitted evils, when the law has given power to do so, only puts off the evil day. It has already bound a heavy burden on the neck of the ratepayer.

We now come again to the necessity of normal regulations. How much cubic contents should be allowed in a house per inmate? How many places of abode can be reared one on another, with due regard to the ventilation, not of the rooms only, but of the area? We shall have, sooner or later, to settle these questions by legislation. But if the experience of which we are in search is only to be obtained at the cost of 160,000*l.* an acre, the least that the ratepayer is entitled to demand is that such costly experiments shall be made one at a time.

It is with great reluctance that we say anything that might be interpreted as in any way throwing an obstacle in the way of improving the dwellings of the poor. It ought to be unnecessary for us to make any disclaimer on that head. But it is certain that the most astute enemy of any reform could not fight his own battle more ably than by attaching to the carrying out of that reform a prohibitory price. If it needs an outlay of 100,000*l.* per acre, or of 200,000*l.* an acre, to clear away a centre of infection, we would be the first to say, "Let it be done." But we should also be the first to ask, "Can it not be done at a lower cost?" If not, there is an end of the matter as far as that individual case is concerned. But there is also an end of the matter in another sense. The number of cases taken in hand will be sharply limited by their cost. At all events, if this is not the case, the public disgust will be so strongly excited that sanitary reform will become checked; and the contention of the worst enemies of sanitary reform,—to the effect that it involves intolerable cost,—will be substantiated.

Our view of the case will at once be adopted by all those professional men, whether architects or doctors, who have had any experience in hospital buildings. Not only the area of the wards, but the distance of the windows of the wards from other buildings, has to be taken into account; so it must be with all great many-chambered buildings. A monastery, covering an acre of ground, and containing 1,333 monks, may be perfectly healthy if perched on the top of the Superga, or on the desolate wilds that surround Mafra. But transplant such a monastery to Geneva, or place three or four of them side by side on contiguous areas of land, in London, and the salubrity of the building will disappear. We have a consumption of oxygen going on in each such building equal to that required for the combustion of 217 tons of coals in the year, or nearly four tons of coal per week! As the figures are large, we will take the action per hour. The equivalent for the result of an hour's respiration of that number of inmates is 55·55 lb. of coal. Allowing this to vitiate the air only to the standard allowance of purity, of one part of carbonic acid in 1,000 parts of air (carbonic acid containing eight equivalents of oxygen to three of carbon) we vitiate 205,000 lb. of air per hour. The volume of one pound of air at 62° Fahrenheit under the pressure of one atmosphere, is 13,141 cubic feet. Take the round number of 13,000 cubic feet, and we have a bulk of 2,665 million cubic feet per hour, that require removal from the building. This will be found to come tolerably near to the change of the entire atmospheric contents of the building per second. But suppose that that enormous amount of ventilation is obtained, what becomes of the expelled air? It goes to supply the next houses, or, at all events, will not be much diluted in its passage thither. Facts like these may be tedious and uninteresting, and they may, even, not entail quite so much evil as they seem to do, but they are not with any safety to be blinked.

The question then is, before, at enormous cost, we deal with areas of urban dwelling, ought we not to agree upon the maximum density of population to be allowed per acre? For a few years, perhaps, it may be more healthy to pack 1,000 persons per acre in new houses than in old ones. But this will not last. We cannot get away from the fact that disease-rates bear a definite relation to sleeping population per acre. The density of population in London varies from 74 persons per acre in the Hanover-square district, to 220 in the St. Giles's district. The corresponding death-rates are 18 and 28 per *mille*.

St. Michael's, Enbourne, Berks.—The chancel of this ancient church is in process of restoration. The south wall was 13½ in. out of perpendicular, and the roof and other parts had by lapse of time become almost worn out. The roof, which was originally an open-timbered one of oak, was covered by a rude lath-and-plaster ceiling. The original roof is now being reinstated, the old timber being used as far as possible. The south wall has been made upright, without pulling it down. The chancel is to be paved with tiles supplied by Maw & Co., and new oak seats are to take the place of the high deal pews. Some interesting wall paintings have been discovered under several coats of whitewash. The rector, the Rev. C. A. Johnson, is defraying the cost of the work, and Mr. Money is the architect employed.

GLOUCESTER COUNTY LUNATIC ASYLUM.

The plans submitted in competition for this proposed building (which is, we believe, correctly described as the "Second County Lunatic Asylum," the county possessing one establishment of the kind already) have been open to inspection at the Shire-hall, Gloucester, during the last few days. We mentioned incidentally last week the titles of some of the plans which we understood had been looked upon with favour, but the contemplated building is of sufficient importance to render some further comment on the designs desirable.

The instructions were for a building to accommodate from 600 to 700 patients, and they have been made out with a degree of care and minuteness of instruction unfortunately not usual in such documents, and which reflects credit on the good sense and consideration of those by whom they were framed. The instructions may, in fact, be said to have in some degree made the plan in advance for the architects, for the relative positions and sizes of the principal departments are so carefully defined that the main disposition of the plan may almost be regarded as fixed by them; and that the competitors have so regarded the matter is evident from the unusual degree of similarity in many of the plans. At the same time, the committee have guarded against too much hampering the architect, by the introduction of a clause to the effect that while they have attempted to enumerate all that may be necessary for an asylum capable of accommodating 700 patients, "they do not wish to limit the architects' designs absolutely to this present statement, the main object being to design a building as perfect as is practicable." Competing architects would have reason to be thankful if all instructions for competitions were drawn up in so full and considerate a spirit.

The planning of a lunatic asylum is a very special kind of problem, differing in its conditions from most others which the architect has to meet. It is a sick asylum or hospital in one sense, but it is not influenced by some of the considerations which most influence the planning of an ordinary hospital for diseases of other classes. Lunacy is not (or so we suppose) a physically contagious malady, however it may be morally or mentally so; consequently the rigid requirement of entire separation between the blocks of building, and the division into as many blocks of limited size as is possible, is not necessarily applicable, on sanitary grounds, to an asylum of this class. But the nature of the disease renders it necessary to have exceptional convenience for overseeing and keeping in order the population of the establishment. Thus it follows that easy intercommunication, and a disposition of the plan which allows of general inspection with little difficulty, is in reality more important than absolute isolation of situation of the different departments.

The committee, or their official advisers, have, however, attached nearly the same importance to isolation of the departments as it is now usual to attach to this point in planning ordinary hospitals. We do not say that their requirements on this head are prejudicial to the building, but merely that we do not see the absolute necessity of such decided isolation, and that the demand for it undoubtedly increases the difficulty of providing a plan the inner working of which will be convenient to the officials. The instructions divide the building into five main departments,—the administrative block, the infirmary block, the epileptic block, the ordinary chronic case block, and the workshop and laundry block. In the last-named department the workshop block on the men's side answers to the laundry block on the women's side, the details of plan, however, being of course different; in the others, each block is to be regarded as in duplicate for men and for women, the plan and all the arrangements being almost exactly similar in the two; except the administrative block, which, of course, is not in duplicate, but is the working centre of the whole establishment. The administrative department includes secretaries' offices and committee-rooms, and the usual accessory rooms for staff administration, the kitchen department and its accessories, and a large dining-hall, to be available also as a recreation-room, and with a stage at one end; this latter to communicate equally with the men's and women's quarters of the establishment. The whole scheme, as here sketched in a general way, of course necessarily presupposes a central position for the administrative portion, with the men's and women's corresponding departments on opposite sides. The committee have further indicated the general arrangement by a provision that the workshop and laundry blocks are to be in the rear of the ward blocks, and that these latter are to be arranged *en échelon*, *i.e.*, in successive blocks receding one behind another. They specify which floors are to be occupied by dormitories and which by day-rooms; that the day-rooms are to face south and to have plenty of light, and the dormitories are nearly all to be provided not only with beds in the general or associated dormitory, but with certain specified numbers of "cubicles," or sleeping-places separated by doors and partitions, the partitions not reaching to the ceiling. These are points which have been variously met in the different plans. The block called the epileptic block has some special features, as only the ground floor in it is really devoted to epileptic patients; the other two floors are to be reached by a staircase quite separate from the ground floor, and are, we presume, to be devoted to ordinary chronic cases, in addition to the space specially provided for these in another block. The dormitory for the epileptic patients is to be on the ground-floor, and the statement is that it is to be on the *north* side of the main corridor. As the portion of each block including the day-rooms is almost necessarily on the *south* side of this corridor, owing to the demand for south light to the day-rooms, there is almost unavoidably an interposition of one of the main corridors of internal traffic between the day department and the dormitory for the epileptic patients. This looks on the plans so bad and so unpractical that we had wondered how the authors of some of the best plans had possibly been led to adopt it, until noticing that it actually arose out of the instructions. It is a mistake in planning, and would certainly lead to awkwardness in the working of this department. The instructions further specify provision for the addition of a chapel and a medical superintendent's house, not at once to be built, but their convenient addition and communication with the main building to be provided for; and the privies and lavatories are of course to be outside of main walls, and with through ventilation between them and the wards. The different blocks are to be united to each other and to the administrative block by a corridor on the ground-floor, "in which angles are to be avoided as far as possible." In regard to style, it is stated that the duty which the committee owe to the county compels them to insist on as rigid economy as is possible in everything not directly connected with the practical objects of the establishment; "while, therefore, they would be compelled to reject a plan which might depress the patients by its gloom and monotony, they would equally reject one which should seek to recommend itself by extravagance of style or by the waste of costly materials." Considering the usual tendency of competitions, it is worth remark that not one of the competitors seems to have ignored this consideration, or attempted to recommend his plan by showy elevations and useless towers. The designs are all comparatively plain and unadorned, as far as architectural effect is concerned, one or two of them perhaps unnecessarily so.

These two provisions, for an arrangement *en échelon* and for corridors in which angles are to be avoided, seem together to lead naturally to the kind of scheme which nearly all the best plans have adopted, consisting of a diagonal arrangement of the main corridors radiating backward each side from the centre of the front portion of the building, with the various departments or blocks opening out of them at intervals. The plan in which this diagonal arrangement is most completely adopted is that signed "Tentanda est Via." In this the main corridors diverge north-east and north-west from the principal entrance in the south front, the successive blocks, lying east and west, opening out of the corridors by a small lobby of communication at the angle of each block. The aim of the author seems to have been to produce an exceedingly symmetrical plan, but in following this end he has allowed himself to be betrayed into ignoring part of the instructions, which specify that the workshop and laundry blocks should be in the rear, while he has made them range with the other blocks, and open out of the corridor on the same side and in the same manner. But the function of these two blocks is so very different from that of the ward blocks, and they obviously require such different provision in the way of approach and access, that it must be considered an entire mistake to range them with the ward blocks. Putting this aside, the plan is one of the better ones of the set, but it has points in detail open to criticism. One of these is that in the dormitories the separate cubicles are merely partitioned off from the main room, and open right on to it. The instructions, it is true, do not specify the contrary; but as these cubicles are obviously intended for patients whom, owing to the special nature of their case, it is desirable to keep separate from the bulk of occupants, it appears to us that to make their cubicles part of the main room is an insufficient and unsatisfactory way of meeting the case, and that they should certainly have a lobby shut off from the associated dormitory. Several of the competitors have taken this view of the point, and we think they are right. The general perspective of this design has a very pleasing effect, and produces some picturesqueness without extravagance, and in a manner quite suitable to the class of building.

"Sunshine all Day" also adopts the diagonal arrangement of the corridors, and provides for his "sunshine" (in the day-rooms) by numerous bay-windows. In this point, however, one or two other competitors are quite up to him. The workshop and laundry departments are in the proper position, and are conveniently connected with, and at the same time divided from, the rest of the building by small quadrant corridors, leading to the angle of the block. There is a great deal that is good in this plan; but, unfortunately, the author does not seem up to detail in some points, more especially in the manner of planning the connexion with the water-closet blocks, which open straight out of the dormitories with very insufficient isolation. The point is not only an important one in itself; but the neglect of it argues want of experience in the right way of doing these things.

"Tria Juncta in Uno" is a plan with a rectangular system of corridors, and on this system provides well for the placing of all the departments according to the requirements; but the system adopted necessitates a great many angles and corners, and makes very long courses of corridor to be traversed in internal communication, and in several of the details it can hardly be called a satisfactory plan for the purpose.

"Experience" is a plan with diagonal corridors, and with the blocks connected angularly with the corridor at regular intervals, somewhat in the same manner as in "Tentanda est Via," but at greater distances, and the blocks are further isolated by short intermediate corridors interposed between them and the main corridor. If complete isolation of each block is an object, it is very thoroughly attained in this plan. The large hall is placed north and south, perpendicularly to the main body of the plan; the workshop and laundry departments adjoin the corridors on either side of it. The day-rooms are very good in shape, with large bays admitting various views and lights, and the latrines are well planned. The architectural design also is very suitable and pleasing, of a character verging towards Gothic, and domestic and homelike in appearance. The alternative design is not so good either in plan or design.

"Utilitas": in the main an admirable plan, on the diagonal principle, two corridors branching off north-east and north-west, connected near their extremities by a long corridor east and west the whole length of the buildings, and this again connected with the diagonal corridors or intermediate points by two corridors running north and south. In none of the other plans, as far as we could observe, is intercommunication provided for so conveniently, with so few angles and so nearly the minimum of corridor length. The day-rooms are very good in shape, having outer walls on two sides, each wall expanding into a large bay, which occupies great part of the side of the room. The author has been alive to the disadvantage of having the dormitory for the epileptic patients separated from the rest of their department by a main corridor, and has in this respect neglected the instructions to the advantage of his plan, getting the ground-floor for the epileptics on the same side of the main corridor as their day department, and in close connexion with it. He has, however, contradicted the instructions as to the same block in another point, in placing a dormitory on the first floor of the block where none is wanted,—apparently an oversight in reading the instructions. The cubicles in the dormitories

are grouped separately on either side of their own passage or lobby, shut out from the general dormitory; and the w.c. department is well planned. The separation of the workshop and laundry departments seems hardly adequate; they are on opposite sides of the large yard in rear of the centre building, but the yard is not divided, and the windows directly face each other. This is not an adequate separation of the male and female departments, as every one knows who has seen or heard much of the difficulties in the oversight of workhouse inmates in some of our older and less scientifically-planned houses; and many of the inmates of a lunatic asylum are not much above the workhouse class socially, with the additional difficulty produced by mental aberration and excitability. The design of the building can hardly be praised. In the elevations it looks sufficiently neat, and shows an ample area of window space; but in the perspective view we must confess it appears to us to come under the category of designs hinted at in the instructions, which "might depress the patients by their gloom or monotony." The blocks are square, bulky, and prison-like: a more picturesque and less loaded style of treatment would have been better for the purpose.

"Glory of Glevum": a plan with corridors in diagonal lines, but at a much more obtuse angle than the others which are treated in this way, and in consequence spreading out the plan laterally to a great extent in a way which does not promote compactness and convenience of intercommunication. The general system is the same as in other plans we have mentioned; the blocks connected at their angles with the diagonal corridors, but they are not so well separated from sight and sound of each other as they would be with a more acute angle of divergence in the main corridors. The laundry and workshop blocks are placed at the opposite extremities of the plan; we should have thought a nearer connexion of these with the administration department was more suitable. The day-rooms are good in shape, and their lavatory accommodation well connected, but this is not so well done in the dormitories, where the angle entrance to the latrines is too near the beds at the same corner, and the passage-way cramped; the cubicles also open direct on the main rooms. The conservatory at the end of the large recreation hall is a good idea, and the detachment of the chapel and the medical superintendent's house, at some distance and with corridors of communication, is a suitable way of adding these buildings. The plan, however, would be a rather long one to walk over, and cause the doctors and attendants much pedestrian exercise. The architectural design, as shown in the perspective view, is one of the most pleasing and suitable of the set; picturesque and attractive without pretence or extravagance.

"Desideratum" shows a peculiarity of plan differing from any other set; the main direction of the corridors and plan is diagonal, but the reverse way to the others, the diagonal being taken south-east and south-west from the back of the centre block, and the main corridors, though connecting the blocks diagonally, are twisted so as to run east and west where they adjoin the blocks, which project at right angles from these portions of the corridor. This arrangement certainly gets over some minor difficulties in planning the entrance to a block of rooms from a passage which cuts into them diagonally; but as the instructions specify that corridors should have as few angles as possible, the author seems to have got himself into a major difficulty in avoiding a minor one. The plan stands fairly in general characteristics, but it is somewhat eccentric.

"Strive" has sent a charming set of drawings; the tinted elevations are very nice in appearance, and very picturesque; but, unfortunately, the plan is full of practical faults.

"Mens Sana" is another plan in which the author has taken a line of his own, even more decidedly than "Desideratum"; for he has directly ignored the main point in the instructions, which requires that the blocks should be arranged *en échelon*. He can hardly hope under these circumstances to come in for selection, though it is a spirited effort to "better his instructions," and shows a great deal of ability. He arranges the whole set of buildings as a great octagon, with blocks at the angles and corridors between, like bastions and curtains. The administration department occupies a part of the centre space, connected by corridors at two or three points with the outer buildings; the route from some of the outlying portions to the centre, however, must either be very circuitous, or must mix the departments too much. The latrines are (mostly) arranged in small octagon buildings connected by short corridors with the internal angles of the octagon. The centre space not occupied by building is laid out as garden and recreation ground, which will thus be very secluded from observation without the expense of high walls built specially for the purpose. The plan has the merit of naturally and almost inevitably making a pleasing and picturesque grouping of the buildings; but this, though not a point to be quite overlooked, is nevertheless so very minor a consideration in a building of this class, that it can hardly count for much; and, considering the plan as a whole, the method of enclosing a space with the buildings in this way has the disadvantage that it must either be unsanitary (if too compressed), or it must be spread so as to make the plan very detached and difficult to oversee as a whole, which latter would be rather the defect in the present case. We must, however, give the author full credit for originality and ingenuity and for good suggestions in some points of treatment of detail.

"Thought" is a rectangular plan, which looks neat and symmetrical, but would be rather cumbrous in working, and one department or block is made the passage to another, which is not only a serious defect in planning, but is contrary to the spirit, if not the letter, of the instructions, which require that the different departments should be connected with each other and with the administrative department by a "corridor," a phrase which clearly points to one corridor, not a set of passages from one block to another. The same objection applies to "Io," which, however, is a very nice-looking building, and has very good points in detail. In regard to the w.c. connexion, we may observe that in this and some other plans the architects, while duly providing a ventilating lobby between the w.c.s and the main building, do not seem awake to the fact that the narrower this lobby is, so long as it allows fair space for passage, the better. It should be only a narrow neck of building, just sufficient for connexion. To carry it right across the full width of the w.c. block is only to weaken the cross ventilation and impair the efficiency of the disconnexion.

"Spectemur agendo," a good plan in general corridor arrangement (diagonal), but faulty in detail, the small rooms for separated patients opening right upon the general day-rooms, &c.

"Échelonne," a right-angle plan mainly, but with diagonal communication from corner to corner of the blocks, the communication being intercepted by octagonal buildings for the latrines, the w.c. rooms each communicating with their own block only, but the lavatories having a door of intercommunication, so as to allow a passage through. There is corridor communication from block to block, separate from this; but, owing to the rectangular form adopted, it is rather round-about, and the only other way is to make use of the lavatories as passages,—a very bad idea, surprising in a plan which, in some respects, shows experience and ability.

"A, B, C": a rectangular plan, which complies with all the requirements except that which demands a minimum of angles in the corridors, a requirement necessarily ignored from the very nature of the general arrangement, and which would make a great deal of pedestrian exercise for the attendants. The author seems, as his motto suggests, to have been aiming at extreme simplicity of arrangement, but what looks simplest on paper is not always so in actual working; real simplicity in plan is attained, in such a building, only by very careful contrivance; *ars est celare artem* is a true motto for plan as well as for design. The same remarks will apply to "*Pro bono lunatico*," a motto, by the way, the flippancy of which is in bad taste. Lunacy is no matter for jesting.

"Light and Air" is a plan arranged partially on the diagonal principle, with latrines in octagonal blocks attached to the angles of the main blocks, in a manner which combines picturesque effect with practical suitability. The plan is not one of the best; in particular, the day-rooms require to be broken up more by bays or projections,—they would be dull and deficient in light at some parts of the day. But it shows consideration and thought, and the architectural treatment, simple and economical in the extreme, is nevertheless picturesque and suitable.

"Deo Juvante" is a fine set of drawings, but can hardly claim praise on practical grounds; rooms and departments are made passages to one another, which is objectionable, and against the spirit of the instructions. "Æsculapius" and "Perseverando" deserve recognition for the labour bestowed on the drawings and the agreeable effect of the elevation, but they can hardly be said to have really grappled with the problem of the plan at all.

One or two other sets of drawings hardly call for remark; but on the whole we may say that we have seldom seen a set of competition drawings for an important building in which, in spite of the lapses that we have pointed out (and we have, for practical reasons, dwelt rather on the points in which each design seemed to come short), there seemed so good an average of merit in proportion to the numbers, and so much evidence of an intention on the part of the competitors to meet the real requirements of the case, instead of merely outbidding each other by showy drawings.*

WHAT WE LEARN FROM THE BOARD OF TRADE RAILWAY RETURNS FOR 1878.

The Railway Companies of the United Kingdom have added 286 miles to the length of line during the year 1878. They have also added 24,486,106*l.* to their capital. The result of the expenditure of the year has been to add 830*l.* to the cost of every mile of railway open in the United Kingdom; that cost having averaged 39,472*l.* in 1877, and 40,301*l.* in 1878. In other words, the cost of our railways has been increased by more than two per cent. in the year per mile of measured distance. As to the capital on which dividend has to be paid, it has been increased by 3·6 per cent. in the year.

In addition to this augmentation, both of gross capital, and of cost per mile, the companies have added 202 locomotives, and 4,933 vehicles of different kinds, to their carrying stock during 1878. In 1877 each locomotive enumerated in the return earned an average sum of 4,750*l.*; so that provision has been made during the past year for conveying an additional traffic to the amount of nearly a million (actually 959,500*l.*) more than in the preceding year. The cost of these engines and vehicles is not given, but that of the locomotives alone must be from 400,000*l.* to 450,000*l.*

Under these circumstances the shareholders may be justly disappointed to learn that the gross earnings of the year 1878, instead of being nearly a million more, have been a ninth of a million less, than those of 1877. There has been a nominal economy of rather more than 666,000*l.* shown as effected in the working charges, but this diminution in the debit of revenue account cannot be said to more than counterbalance the amount by which that account must have been increased by the virtual paying out of capital for stock not required for additional traffic. Thus the least that can be said is, that the entire capital spent within the year has been spent unproductively.

The locomotive is the true bread-winner of the railway proprietors. And it is a bread-winner that never grumbles if taxed to the full extent of its powers. The more economically an engine is worked, as regards the provision of fuel, the better for its durability. Due care, and immediate repair, when it first becomes proper, are all that the engine requires, in order to maintain its highest efficiency. And not only is that the case, but a hint given by foreign practice leads to the hope that more, rather than less, duty may hereafter be obtained from the locomotive. On the Odessa Railway, which is 650 miles in length, we are told by an extract from a German paper in the recently-issued vol. lvii. of the Minutes of Proceedings of the Institution of Civil Engineers, that the system of each driver having his own engine has been given up for the goods service, and continuous working has been substituted. The result has been that the number of locomotives required for the train-service has been reduced in the proportion of 13 to 10. At first the time expended in repairs rose somewhat under the new system, but it has again fallen. On other lines it appears that a marked decrease, both in cost of repairs and consumption of fuel, has followed the adoption

* As we go to press, we learn that the Committee have awarded the first premium to Messrs. John Giles & Gough, of London ("Experience"); and the second premium to Mr. Pritchett, of Darlington ("Sunshine all Day").

of the continuous system. When we contrast experience of this kind with that of the increase of locomotive work in 1878, it is clear that there is some room for improvement in that item of our railway management. Every locomotive on our lists in 1878 earned only 4,662*l.*, against 4,750*l.* in 1877.

There is a remarkable contrast between the movement of the six great passenger-lines through and out of London, and that of the six great mineral-conveying lines, including the North-Eastern, that radiate from the metropolis. Commencing with the latter group, we ascertain from the returns of 1878 that six great lines, covering an aggregate length of more than 8,000 miles, have cost rather more than 41,000*l.* per mile. Their aggregate earnings in 1878 amounted to nearly 35,000,000*l.*, of which about 13,500,000*l.* was earned from passengers, and 8,500,000*l.* from mineral traffic, the latter thus composing 41 per cent. of the gross revenue. The cost of working has been 18,500,000*l.*, being nearly 53 per cent. of the gross income, giving a return of 4·6 per cent. on the capital.

During the year 1878 these lines have earned 217,762*l.* less than they earned in 1877. Their aggregate capital has been increased by 29,000,000*l.* within the year, although a portion of this increase has been only nominal, caused by the conversion of stock. The working expenses for the year have been reduced 135,000*l.*, or by about 0·73 per cent. A portion of this increase of capital has been expended on ninety-nine new locomotive engines, to work a diminished traffic. Supposing that out of the whole stock of engines, old and new, ninety-nine were idle for the year, the remainder of the stock will still have earned 20*l.* per engine less than in 1877.

Reverting now to the other, or passenger, group of lines, we find that six great lines, extending over a length of 1,563 miles, have cost neatly 99,000,000*l.*, or more than 63,000*l.* per mile, mainly owing to the cost of metropolitan property and Thames bridges. Their aggregate gross earnings in 1878 were rather under 9,000,000*l.*, of which less than 5 per cent. was derived from the carriage of minerals. The working cost has amounted to 4,466,000*l.*, or 49·6 per cent. on the gross receipts. The net earning thus amounts to 4·53 per cent. on the large mileage cost of these lines.

During the year 1878 these lines have earned 385,500*l.* more than they did in 1877. Their aggregate capital has been increased by 3,107,000*l.*, and the working expenses have shown an increase of 224,700*l.*, being about 0·5 per cent. on the expenditure of 1877. Twenty-four engines have been added to the stock. If we assume that each of the old engines earned the same in 1878 as it did in 1877, each new engine will have earned more than 15,000*l.*, or more than three times the average earnings of the locomotives on the English railways.

Thus the first group of lines has increased its capital by more than 8 per cent., and its engine power by 1·3 per cent. to earn 0·6 per cent. less traffic, with a nominal saving of 0·7 per cent. on working cost, or rather less than 0·33 per cent. on gross income.

The second group of lines has increased its capital by 3·1 per cent., and its locomotive stock by 2 per cent., and has earned 4·3 per cent. more gross income, at an increase of working cost of about 5·3 per cent. on that of 1877, or about 2¼ per cent. on the gross income of that year.

Facts such as these, which are the simple outcome of the Board of Trade Returns, are enough to call the attention of the country to the questions which Sir George Balfour has given notice that he shall put to the President of the Board of Trade. These are as follows, not quoting the exact language, but giving the gist:—

Will the Government take measures to obtain from the railway companies such statistical information as will allow of the determination of the cost of carriage of the different classes of passengers, and of the different descriptions of merchandise, as is done on the Indian railways and on those of New South Wales?

Will they ascertain the rates charged on all lines for passengers, of each class, and for each description of merchandise or mineral transport, distinguishing local from through, or from competitive traffic, where any difference exists?

Will they seek to obtain the power of auditing or supervising the accounts given to shareholders?

Will they produce information as to the damaged or useless stock that is included in the annual returns made by the railway companies?

Of the two distinct classes of information contemplated in the above notice, one is most essential to the shareholders, the other to the customers. Mr. Paraloe's little book, called "Our Railways," shows the great injustice to which freighters are subjected, by the practical refusal of the railway companies to give full and frank information on the subject of freight charges. On the other hand, if each railway company in England were compelled to state the average distances for which they carried a passenger or a ton of goods, or, which comes to the same thing, the gross number of passenger miles and of goods ton miles from which their gross revenues are derived, the relative profit and loss of various descriptions of traffic would not much longer be kept a profound secret.

A comparative statement of the earnings of each passenger locomotive and each goods locomotive, as well as of each description of vehicle, would, in itself, be a most instructive paper. In 1877 these varied, on the twenty principal lines analysed by Mr. Fleming, from 12,176*l.* per engine, and 2,830*l.* per carriage, on the Metropolitan, to 3,719*l.* per engine on the Manchester, Sheffield, and Lincoln, and to 47*l.* per wagon on the Caledonian. Considering the allowance to be made for the return of empty wagons, it probably costs a company as much per mile to transport the wagon earning 47*l.* as the coach earning 2,830*l.* by its year's work.

It may be added that the Metropolitan Railway has earned 944*l.* per engine, and the Metropolitan District 816*l.* per engine, more in 1878 than they did in 1877. On the other hand, the Midland, with a stock augmented by forty-three engines, has earned 86*l.* per engine, and the North-Eastern, with no addition to its locomotive stock, 247*l.* per engine, less in 1878 than was the case in 1877.

FROM THE BANKS OF THE SEINE.

A LAW case, which came before the *Cour de Cassation*, or as we should say, the Court of Appeal, on the 5th inst., has occupied the attention of not a small portion of the architectural profession during the last week. For how long a time has the proprietor a remedy against architect and contractor for flaws in construction which show themselves in the work they have designed, directed, or executed? It is not often in France that one hears of complaints of this nature on the part of house-owners, for happily "jerry builders" scarcely exist, and the houses that are now rising in every quarter of Paris are certainly not intended for even exactly ninety-nine years' leases; indeed, they are built, if not for eternity, at least for many centuries.

By the terms of articles 1,792 and 2,270 of the *Code Civil*, the architect and contractor are responsible for ten years, dating from the completion of the works, for any vices in their construction. The *Cour de Paris*, interpreting the letter of these articles, had more than once (previously to 1857) decided that at the end of ten years all responsibility ceased on the part of contractor and architect; once this period was passed, no action could be commenced. In other terms, it had been held that, for the architect to be liable, it was not sufficient that the vices should have manifested themselves in the course of the ten years' delay, but, in addition, the action must be brought before the expiration of that term, in default of which it was untenable. It is this jurisprudence, often combated, that the Supreme Court had some time since for the first time to consider, in the appeal made by the Comtesse de Béarn against M. Parent, architect, who had been entrusted by her in 1862 with the execution of various works of restoration and enlargement of her château at Clèvres. The works were terminated in 1863, but in the course of 1873 grave defects and flaws manifesting themselves in the work, an expert was called in to decide the responsibility of the architect; this done, in 1875 M. Parent was summoned as responsible for the defects existing. To this the architect opposed the terms of the article above referred to, the stipulated period having been passed two years previously to the action. The appeal maintained that the existence of the evils having been noticed *before* the expiration of the legal delay, the time at which the action was brought was not limited by the terms of the law,—indeed, was still valid during a delay of thirty years (according to common law) and capable of being suspended over a possible minority of an heir. To produce the complicated arguments *pro* and *con.* would be difficult with the limited space at our disposal; suffice it to say, that the Court of Appeal, after having heard the pleading of the several advocates, annulled the decision referred to by deciding that the articles 1,792 and 2,270 referred only to the duration of the guarantee, and the law not having decided on the duration of the power of the action, that action, once originated, could not be put aside during the ordinary prescription of thirty years. It would be interesting to know what cases of a like nature have come before the English Courts, and in what way they were decided.

The mention of this lawsuit recalls an incident in the life of Fechter, the news of whose death has produced not a little feeling on the banks of the Seine, where his earliest triumphs delighted the Parisian public. It is an incident which is scarcely likely to be recalled in any of the many biographies which will doubtless shortly appear of the first actor who played "Hamlet" in a flaxen wig. Some fifteen or sixteen years ago a gigantic and beautiful cotton plant overshadowed and beautified the house of Fechter, then residing at No. 20 in the Rue de Navarin, one of the many characteristic streets lying at the back of Notre Dame de Loretto. By the exigencies of M. Haussmann's plans the cotton plant had to be torn down. Fechter, who had enjoyed the beauty of the greenery, demanded immediately the cancelling of his lease, and in bringing the matter before the courts was awarded, in addition to his claim, satisfactory damages; for full particulars of all which we refer the curious to the pages of the *Gazette des Tribunaux* for January 12th, 1861.

We had occasion last week to speak of the competition for the Grand Prix de Rome in architecture. On Tuesday the members of the architectural section of the École des Beaux Arts met, and, after two and a half hours' deliberation, awarded the Grand Prix to M. Victor Auguste Blavette, born in 1850, and pupil of M. Ginain. The first second Grand Prix to M. Charles Girault, born in 1851, pupil of M. Daumet; the second second Grand Prix to M. Charles Jennings, born in 1852, and pupil of M. Train. It will be instructive to watch the progress of these artists in the drawings which before long they will send home from the Villa Medici and the School at Athens; for the young architect in the Eternal City and in the land of Ictinus and Callicrates, indeed, may be envied, with the noble examples with which he is brought into actual contact,—a privilege and advantage which his brother artists the painters and sculptors can scarcely be said any longer to enjoy in their respective lines of study in Rome and Greece.

It may not be uninteresting to archæologists, while we are speaking of the French School in Athens, to learn that a former member of that school, M. Homolle, has recently left France for the Island of Delos (in the Grecian archipelago), entrusted by the French Government with the duty of continuing the excavations commenced some years since in that interesting island by the École Française. Delos, it will be remembered, was famous in antiquity for the oracles which were pronounced in the magnificent temple consecrated to Apollo, who was born in the island, according to a mythological tradition. Already many precious remains of the oracle and temple,—one of the finest in Greece,—have been unearthed, and before long we may expect to hear interesting news from the neighbourhood of our own now famous and new archæological hunting-ground, Cyprus.

Active preparations are being made at the Palais Bourbon for the reception of the Deputies in November next. Arranged for the Chamber of the Empire, which only consisted of 290 members, the palace has now to hold 525 deputies, while the increased development of the services for the Parliament require enlarged dependencies. All that will come from Versailles is the "*tribune*," which plays so important a part in French politics; for the deputies, as most persons know, do not, like our members of the two Houses, address the Speaker from their places, but the whole house, from the tribune, at the feet of the President of the Chamber. As may be imagined, the architect of the works has no easy task before him. At the palace of the Luxembourg the same activity is observable in the preparations for the Senate. Official Paris, indeed, is entirely "on the move," the Pavillon de Flore at the Tuileries being rapidly put in order to receive the Prefecture of the Seine, to be transferred thither from the Luxembourg.

are grouped separately on either side of their own passage or lobby, shut out from the general dormitory; and the w.c. department is well planned. The separation of the workshop and laundry departments seems hardly adequate; they are on opposite sides of the large yard in rear of the centre building, but the yard is not divided, and the windows directly face each other. This is not an adequate separation of the male and female departments, as every one knows who has seen or heard much of the difficulties in the oversight of workhouse inmates in some of our older and less scientifically-planned houses; and many of the inmates of a lunatic asylum are not much above the workhouse class socially, with the additional difficulty produced by mental aberration and excitability. The design of the building can hardly be praised. In the elevations it looks sufficiently neat, and shows an ample area of window space; but in the perspective view we must confess it appears to us to come under the category of designs hinted at in the instructions, which "might depress the patients by their gloom or monotony." The blocks are square, bulky, and prison-like: a more picturesque and less loaded style of treatment would have been better for the purpose.

"Glory of Glevum": a plan with corridors in diagonal lines, but at a much more obtuse angle than the others which are treated in this way, and in consequence spreading out the plan laterally to a great extent in a way which does not promote compactness and convenience of intercommunication. The general system is the same as in other plans we have mentioned; the blocks connected at their angles with the diagonal corridors, but they are not so well separated from sight and sound of each other as they would be with a more acute angle of divergence in the main corridors. The laundry and workshop blocks are placed at the opposite extremities of the plan; we should have thought a nearer connexion of these with the administration department was more suitable. The day-rooms are good in shape, and their lavatory accommodation well connected, but this is not so well done in the dormitories, where the angle entrance to the latrines is too near the beds at the same corner, and the passage-way cramped; the cubicles also open direct on the main rooms. The conservatory at the end of the large recreation hall is a good idea, and the detachment of the chapel and the medical superintendent's house, at some distance and with corridors of communication, is a suitable way of adding these buildings. The plan, however, would be a rather long one to walk over, and cause the doctors and attendants much pedestrian exercise. The architectural design, as shown in the perspective view, is one of the most pleasing and suitable of the set; picturesque and attractive without pretence or extravagance.

"Desideratum" shows a peculiarity of plan differing from any other set; the main direction of the corridors and plan is diagonal, but the reverse way to the others, the diagonal being taken south-east and south-west from the back of the centre block, and the main corridors, though connecting the blocks diagonally, are twisted so as to run east and west where they adjoin the blocks, which project at right angles from these portions of the corridor. This arrangement certainly gets over some minor difficulties in planning the entrance to a block of rooms from a passage which cuts into them diagonally; but as the instructions specify that corridors should have as few angles as possible, the author seems to have got himself into a major difficulty in avoiding a minor one. The plan stands fairly in general characteristics, but it is somewhat eccentric.

"Strive" has sent a charming set of drawings; the tinted elevations are very nice in appearance, and very picturesque; but, unfortunately, the plan is full of practical faults.

"Mens Sana" is another plan in which the author has taken a line of his own, even more decidedly than "Desideratum"; for he has directly ignored the main point in the instructions, which requires that the blocks should be arranged *en échelon*. He can hardly hope under these circumstances to come in for selection, though it is a spirited effort to "better his instructions," and shows a great deal of ability. He arranges the whole set of buildings as a great octagon, with blocks at the angles and corridors between, like bastions and curtains. The administration department occupies a part of the centre space, connected by corridors at two or three points with the outer buildings; the route from some of the outlying portions to the centre, however, must either be very circuitous, or must mix the departments too much. The latrines are (mostly) arranged in small octagon buildings connected by short corridors with the internal angles of the octagon. The centre space not occupied by building is laid out as garden and recreation ground, which will thus be very secluded from observation without the expense of high walls built specially for the purpose. The plan has the merit of naturally and almost inevitably making a pleasing and picturesque grouping of the buildings; but this, though not a point to be quite overlooked, is nevertheless so very minor a consideration in a building of this class, that it can hardly count for much; and, considering the plan as a whole, the method of enclosing a space with the buildings in this way has the disadvantage that it must either be unsanitary (if too compressed), or it must be spread so as to make the plan very detached and difficult to oversee as a whole, which latter would be rather the defect in the present case. We must, however, give the author full credit for originality and ingenuity and for good suggestions in some points of treatment of detail.

"Thought" is a rectangular plan, which looks neat and symmetrical, but would be rather cumbrous in working, and one department or block is made the passage to another, which is not only a serious defect in planning, but is contrary to the spirit, if not the letter, of the instructions, which require that the different departments should be connected with each other and with the administrative department by a "corridor," a phrase which clearly points to one corridor, not a set of passages from one block to another. The same objection applies to "Io," which, however, is a very nice-looking building, and has very good points in detail. In regard to the w.c. connexion, we may observe that in this and some other plans the architects, while duly providing a ventilating lobby between the w.c.s and the main building, do not seem awake to the fact that the narrower this lobby is, so long as it allows fair space for passage, the better. It should be only a narrow neck of building, just sufficient for connexion. To carry it right across the full width of the w.c. block is only to weaken the cross ventilation and impair the efficiency of the disconnexion.

"Spectemur agendo," a good plan in general corridor arrangement (diagonal), but faulty in detail, the small rooms for separated patients opening right upon the general day-rooms, &c.

"Échelonne," a right-angle plan mainly, but with diagonal communication from corner to corner of the blocks, the communication being intercepted by octagonal buildings for the latrines, the w.c. rooms each communicating with their own block only, but the lavatories having a door of intercommunication, so as to allow a passage through. There is corridor communication from block to block, separate from this; but, owing to the rectangular form adopted, it is rather round-about, and the only other way is to make use of the lavatories as passages,—a very bad idea, surprising in a plan which, in some respects, shows experience and ability.

"A, B, C": a rectangular plan, which complies with all the requirements except that which demands a minimum of angles in the corridors, a requirement necessarily ignored from the very nature of the general arrangement, and which would make a great deal of pedestrian exercise for the attendants. The author seems, as his motto suggests, to have been aiming at extreme simplicity of arrangement, but what looks simplest on paper is not always so in actual working; real simplicity in plan is attained, in such a building, only by very careful contrivance; *ars est celare artem* is a true motto for plan as well as for design. The same remarks will apply to "*Pro bono lunatico*," a motto, by the way, the flippancy of which is in bad taste. Lunacy is no matter for jesting.

"Light and Air" is a plan arranged partially on the diagonal principle, with latrines in octagonal blocks attached to the angles of the main blocks, in a manner which combines picturesque effect with practical suitability. The plan is not one of the best; in particular, the day-rooms require to be broken up more by bays or projections,—they would be dull and deficient in light at some parts of the day. But it shows consideration and thought, and the architectural treatment, simple and economical in the extreme, is nevertheless picturesque and suitable.

"Deo Juvante" is a fine set of drawings, but can hardly claim praise on practical grounds; rooms and departments are made passages to one another, which is objectionable, and against the spirit of the instructions. "Æsculapius" and "Perseverando" deserve recognition for the labour bestowed on the drawings and the agreeable effect of the elevation, but they can hardly be said to have really grappled with the problem of the plan at all.

One or two other sets of drawings hardly call for remark; but on the whole we may say that we have seldom seen a set of competition drawings for an important building in which, in spite of the lapses that we have pointed out (and we have, for practical reasons, dwelt rather on the points in which each design seemed to come short), there seemed so good an average of merit in proportion to the numbers, and so much evidence of an intention on the part of the competitors to meet the real requirements of the case, instead of merely outbidding each other by showy drawings.*

WHAT WE LEARN FROM THE BOARD OF TRADE RAILWAY RETURNS FOR 1878.

The Railway Companies of the United Kingdom have added 286 miles to the length of line during the year 1878. They have also added 24,486,106*l.* to their capital. The result of the expenditure of the year has been to add 830*l.* to the cost of every mile of railway open in the United Kingdom; that cost having averaged 39,472*l.* in 1877, and 40,301*l.* in 1878. In other words, the cost of our railways has been increased by more than two per cent. in the year per mile of measured distance. As to the capital on which dividend has to be paid, it has been increased by 3·6 per cent. in the year.

In addition to this augmentation, both of gross capital, and of cost per mile, the companies have added 202 locomotives, and 4,933 vehicles of different kinds, to their carrying stock during 1878. In 1877 each locomotive enumerated in the return earned an average sum of 4,750*l.*; so that provision has been made during the past year for conveying an additional traffic to the amount of nearly a million (actually 959,500*l.*) more than in the preceding year. The cost of these engines and vehicles is not given, but that of the locomotives alone must be from 400,000*l.* to 450,000*l.*

Under these circumstances the shareholders may be justly disappointed to learn that the gross earnings of the year 1878, instead of being nearly a million more, have been a ninth of a million less, than those of 1877. There has been a nominal economy of rather more than 666,000*l.* shown as effected in the working charges, but this diminution in the debit of revenue account cannot be said to more than counterbalance the amount by which that account must have been increased by the virtual paying out of capital for stock not required for additional traffic. Thus the least that can be said is, that the entire capital spent within the year has been spent unproductively.

The locomotive is the true bread-winner of the railway proprietors. And it is a bread-winner that never grumbles if taxed to the full extent of its powers. The more economically an engine is worked, as regards the provision of fuel, the better for its durability. Due care, and immediate repair, when it first becomes proper, are all that the engine requires, in order to maintain its highest efficiency. And not only is that the case, but a hint given by foreign practice leads to the hope that more, rather than less, duty may hereafter be obtained from the locomotive. On the Odessa Railway, which is 650 miles in length, we are told by an extract from a German paper in the recently-issued vol. lvii. of the Minutes of Proceedings of the Institution of Civil Engineers, that the system of each driver having his own engine has been given up for the goods service, and continuous working has been substituted. The result has been that the number of locomotives required for the train-service has been reduced in the proportion of 13 to 10. At first the time expended in repairs rose somewhat under the new system, but it has again fallen. On other lines it appears that a marked decrease, both in cost of repairs and consumption of fuel, has followed the adoption

* As we go to press, we learn that the Committee have awarded the first premium to Messrs. John Giles & Gough, of London ("Experience"); and the second premium to Mr. Pritchett, of Darlington ("Sunshine all Day").

of the continuous system. When we contrast experience of this kind with that of the increase of locomotive work in 1878, it is clear that there is some room for improvement in that item of our railway management. Every locomotive on our lists in 1878 earned only 4,662*l.*, against 4,750*l.* in 1877.

There is a remarkable contrast between the movement of the six great passenger-lines through and out of London, and that of the six great mineral-conveying lines, including the North-Eastern, that radiate from the metropolis. Commencing with the latter group, we ascertain from the returns of 1878 that six great lines, covering an aggregate length of more than 8,000 miles, have cost rather more than 41,000*l.* per mile. Their aggregate earnings in 1878 amounted to nearly 35,000,000*l.*, of which about 13,500,000*l.* was earned from passengers, and 8,500,000*l.* from mineral traffic, the latter thus composing 41 per cent. of the gross revenue. The cost of working has been 18,500,000*l.*, being nearly 53 per cent. of the gross income, giving a return of 4·6 per cent. on the capital.

During the year 1878 these lines have earned 217,762*l.* less than they earned in 1877. Their aggregate capital has been increased by 29,000,000*l.* within the year, although a portion of this increase has been only nominal, caused by the conversion of stock. The working expenses for the year have been reduced 135,000*l.*, or by about 0·73 per cent. A portion of this increase of capital has been expended on ninety-nine new locomotive engines, to work a diminished traffic. Supposing that out of the whole stock of engines, old and new, ninety-nine were idle for the year, the remainder of the stock will still have earned 20*l.* per engine less than in 1877.

Reverting now to the other, or passenger, group of lines, we find that six great lines, extending over a length of 1,563 miles, have cost neatly 99,000,000*l.*, or more than 63,000*l.* per mile, mainly owing to the cost of metropolitan property and Thames bridges. Their aggregate gross earnings in 1878 were rather under 9,000,000*l.*, of which less than 5 per cent. was derived from the carriage of minerals. The working cost has amounted to 4,466,000*l.*, or 49·6 per cent. on the gross receipts. The net earning thus amounts to 4·53 per cent. on the large mileage cost of these lines.

During the year 1878 these lines have earned 385,500*l.* more than they did in 1877. Their aggregate capital has been increased by 3,107,000*l.*, and the working expenses have shown an increase of 224,700*l.*, being about 0·5 per cent. on the expenditure of 1877. Twenty-four engines have been added to the stock. If we assume that each of the old engines earned the same in 1878 as it did in 1877, each new engine will have earned more than 15,000*l.*, or more than three times the average earnings of the locomotives on the English railways.

Thus the first group of lines has increased its capital by more than 8 per cent., and its engine power by 1·3 per cent. to earn 0·6 per cent. less traffic, with a nominal saving of 0·7 per cent. on working cost, or rather less than 0·33 per cent. on gross income.

The second group of lines has increased its capital by 3·1 per cent., and its locomotive stock by 2 per cent., and has earned 4·3 per cent. more gross income, at an increase of working cost of about 5·3 per cent. on that of 1877, or about 2¼ per cent. on the gross income of that year.

Facts such as these, which are the simple outcome of the Board of Trade Returns, are enough to call the attention of the country to the questions which Sir George Balfour has given notice that he shall put to the President of the Board of Trade. These are as follows, not quoting the exact language, but giving the gist:—

Will the Government take measures to obtain from the railway companies such statistical information as will allow of the determination of the cost of carriage of the different classes of passengers, and of the different descriptions of merchandise, as is done on the Indian railways and on those of New South Wales?

Will they ascertain the rates charged on all lines for passengers, of each class, and for each description of merchandise or mineral transport, distinguishing local from through, or from competitive traffic, where any difference exists?

Will they seek to obtain the power of auditing or supervising the accounts given to shareholders?

Will they produce information as to the damaged or useless stock that is included in the annual returns made by the railway companies?

Of the two distinct classes of information contemplated in the above notice, one is most essential to the shareholders, the other to the customers. Mr. Parsloe's little book, called "Our Railways," shows the great injustice to which freighters are subjected, by the practical refusal of the railway companies to give full and frank information on the subject of freight charges. On the other hand, if each railway company in England were compelled to state the average distances for which they carried a passenger or a ton of goods, or, which comes to the same thing, the gross number of passenger miles and of goods ton miles from which their gross revenues are derived, the relative profit and loss of various descriptions of traffic would not much longer be kept a profound secret.

A comparative statement of the earnings of each passenger locomotive and each goods locomotive, as well as of each description of vehicle, would, in itself, be a most instructive paper. In 1877 these varied, on the twenty principal lines analysed by Mr. Fleming, from 12,176*l.* per engine, and 2,830*l.* per carriage, on the Metropolitan, to 3,719*l.* per engine on the Manchester, Sheffield, and Lincoln, and to 47*l.* per wagon on the Caledonian. Considering the allowance to be made for the return of empty wagons, it probably costs a company as much per mile to transport the wagon earning 47*l.* as the coach earning 2,830*l.* by its year's work.

It may be added that the Metropolitan Railway has earned 944*l.* per engine, and the Metropolitan District 816*l.* per engine, more in 1878 than they did in 1877. On the other hand, the Midland, with a stock augmented by forty-three engines, has earned 86*l.* per engine, and the North-Eastern, with no addition to its locomotive stock, 247*l.* per engine, less in 1878 than was the case in 1877.

FROM THE BANKS OF THE SEINE.

A LAW case, which came before the *Cour de Cassation*, or as we should say, the Court of Appeal, on the 5th inst., has occupied the attention of not a small portion of the architectural profession during the last week. For how long a time has the proprietor a remedy against architect and contractor for flaws in construction which show themselves in the work they have designed, directed, or executed? It is not often in France that one hears of complaints of this nature on the part of house-owners, for happily "jerry builders" scarcely exist, and the houses that are now rising in every quarter of Paris are certainly not intended for even exactly ninety-nine years' leases; indeed, they are built, if not for eternity, at least for many centuries.

By the terms of articles 1,792 and 2,270 of the *Code Civil*, the architect and contractor are responsible for ten years, dating from the completion of the works, for any vices in their construction. The *Cour de Paris*, interpreting the letter of these articles, had more than once (previously to 1857) decided that at the end of ten years all responsibility ceased on the part of contractor and architect; once this period was passed, no action could be commenced. In other terms, it had been held that, for the architect to be liable, it was not sufficient that the vices should have manifested themselves in the course of the ten years' delay, but, in addition, the action must be brought before the expiration of that term, in default of which it was untenable. It is this jurisprudence, often combated, that the Supreme Court had some time since for the first time to consider, in the appeal made by the Comtesse de Béarn against M. Parent, architect, who had been entrusted by her in 1862 with the execution of various works of restoration and enlargement of her château at Clèvres. The works were terminated in 1863, but in the course of 1873 grave defects and flaws manifesting themselves in the work, an expert was called in to decide the responsibility of the architect; this done, in 1875 M. Parent was summoned as responsible for the defects existing. To this the architect opposed the terms of the article above referred to, the stipulated period having been passed two years previously to the action. The appeal maintained that the existence of the evils having been noticed *before* the expiration of the legal delay, the time at which the action was brought was not limited by the terms of the law,—indeed, was still valid during a delay of thirty years (according to common law) and capable of being suspended over a possible minority of an heir. To produce the complicated arguments *pro* and *con.* would be difficult with the limited space at our disposal; suffice it to say, that the Court of Appeal, after having heard the pleading of the several advocates, annulled the decision referred to by deciding that the articles 1,792 and 2,270 referred only to the duration of the guarantee, and the law not having decided on the duration of the power of the action, that action, once originated, could not be put aside during the ordinary prescription of thirty years. It would be interesting to know what cases of a like nature have come before the English Courts, and in what way they were decided.

The mention of this lawsuit recalls an incident in the life of Fechter, the news of whose death has produced not a little feeling on the banks of the Seine, where his earliest triumphs delighted the Parisian public. It is an incident which is scarcely likely to be recalled in any of the many biographies which will doubtless shortly appear of the first actor who played "Hamlet" in a flaxen wig. Some fifteen or sixteen years ago a gigantic and beautiful cotton plant overshadowed and beautified the house of Fechter, then residing at No. 20 in the Rue de Navarin, one of the many characteristic streets lying at the back of Notre Dame de Lorette. By the exigencies of M. Haussmann's plans the cotton plant had to be torn down. Fechter, who had enjoyed the beauty of the greenery, demanded immediately the cancelling of his lease, and in bringing the matter before the courts was awarded, in addition to his claim, satisfactory damages; for full particulars of all which we refer the curious to the pages of the *Gazette des Tribunaux* for January 12th, 1861.

We had occasion last week to speak of the competition for the Grand Prix de Rome in architecture. On Tuesday the members of the architectural section of the École des Beaux Arts met, and, after two and a half hours' deliberation, awarded the Grand Prix to M. Victor Auguste Blavette, born in 1850, and pupil of M. Ginain. The first second Grand Prix to M. Charles Girault, born in 1851, pupil of M. Daumet; the second second Grand Prix to M. Charles Jennings, born in 1852, and pupil of M. Train. It will be instructive to watch the progress of these artists in the drawings which before long they will send home from the Villa Medici and the School at Athens; for the young architect in the Eternal City and in the land of Ictinus and Callicrates, indeed, may be envied, with the noble examples with which he is brought into actual contact,—a privilege and advantage which his brother artists the painters and sculptors can scarcely be said any longer to enjoy in their respective lines of study in Rome and Greece.

It may not be uninteresting to archæologists, while we are speaking of the French School in Athens, to learn that a former member of that school, M. Homolle, has recently left France for the Island of Delos (in the Grecian archipelago), entrusted by the French Government with the duty of continuing the excavations commenced some years since in that interesting island by the École Française. Delos, it will be remembered, was famous in antiquity for the oracles which were pronounced in the magnificent temple consecrated to Apollo, who was born in the island, according to a mythological tradition. Already many precious remains of the oracle and temple,—one of the finest in Greece,—have been unearthed, and before long we may expect to hear interesting news from the neighbourhood of our own now famous and new archæological hunting-ground, Cyprus.

Active preparations are being made at the Palais Bourbon for the reception of the Deputies in November next. Arranged for the Chamber of the Empire, which only consisted of 290 members, the palace has now to hold 525 deputies, while the increased development of the services for the Parliament require enlarged dependencies. All that will come from Versailles is the "*tribune*," which plays so important a part in French politics; for the deputies, as most persons know, do not, like our members of the two Houses, address the Speaker from their places, but the whole house, from the tribune, at the feet of the President of the Chamber. As may be imagined, the architect of the works has no easy task before him. At the palace of the Luxembourg the same activity is observable in the preparations for the Senate. Official Paris, indeed, is entirely "on the move," the Pavillon de Flore at the Tuileries being rapidly put in order to receive the Prefecture of the Seine, to be transferred thither from the Luxembourg.

PUBLIC HEALTH IN CORK.

The British Medical Association, at their meeting held last week in Cork, included a Public Health Section and an Exhibition of Sanitary Appliances. At a meeting of the former,

Dr. Pacciotti, of Turin, informed the meeting that the International Congress of Hygiene would be held in Turin in April next, and he would welcome to Italy all friends who might desire to be present on the occasion. He said the king was very liberal, the Government gave money, and the mayor and citizens of Turin would do their duty in the matter of hospitality to all foreigners.

A discussion was then opened on "The Influence of Drinking-Water in originating or propagating Enteric Fever, Diarrhœa, Diphtheria, and Scarlatina."

The discussion was commenced by Dr. Andrew Fergus, of Glasgow, who confined himself to matters that came under his own observation. He said that until comparatively recently Glasgow was supplied with river water which contained the drainage of the towns higher up. In 1848 cholera prevailed universally in Glasgow. No district was specially exempt from the disease. In 1854 the south side of the city, inhabited by the working population, had got a pure supply of gravitation water, and it was remarked at the time that the south side suffered very little from cholera. There was no registration at that time, and they could not bring that point to the touchstone of figures; but the experience of all medical men at the time was, that though there was not complete exemption, there was a very marked exemption from the disease in the south side, which had the supply of pure water. By the year 1866 all Glasgow was supplied with pure water, and though since then they had imported cases of cholera, though the poison was there, it did not take any hold on the city whatever. There was also a marked diminution in the prevalence of cases of diphtheria since Glasgow got a supply of pure water. He remembered once going to a fine house in a beautiful country, and three of the inmates were down with typhoid fever, and on investigating it he found that the cause of it was impure well-water. In another instance, he was told by a lady that her family had never been well since they removed to a very large house, and on making inquiries it turned out that there was a cesspool with an open grating in close proximity to the well which supplied the house with water. The same thing occurred in cases of diphtheria, and he (Dr. Fergus) had found many cases which were clearly traceable to impure water. On the return of several families to Glasgow from a watering-place which has been called the Brighton of Scotland, many of the inmates were suffering from typhoid fever, and an examination of the wells in the vicinity of the place being made, it was discovered that every one of the twenty-eight wells showed evidences of organic pollution, when he (Dr. Fergus) employed the only test he could—that of the Nesslear solution. He would counsel people to have the water attached to a house always tested before taking the house, and if the water was at all suspected, let it be distilled. Water contaminated by sewage was not unpleasant to drink, for the reason that the organic matter decomposes, and the process of decomposition produced chemical action which rendered the water sparkling and cooling, and almost pleasant to the palate. Not alone should all communities be supplied with pure water, but all sources of impure water should be cut off. Dr. Fergus concluded by saying that in some cases it was hard to overcome the partiality people had for old practices, and he related how in the case of a favourite well in Glasgow,—the closing up of which would have caused an outbreak,—the authorities got over the difficulty by turning the pure Loch Katrine water into the well, and the people went and drank out of the well as before.

Dr. Alfred Carpenter, president of the council, read a paper on the dual requirements of enteric fever, and the fallacies based upon a narrow view of the germ theory. He said that some writers assumed that if an enteric germ found admission into a pure water-supply, it retained its vitality. He pointed out the fallacies contained in this, as also in the beliefs which were often expressed that there was no limit to the distance which the contagion might not be transmitted underground. He also believed that filtration would not alter the contagious nature of the particles, and also that neither microscopical nor chemical analysis was able to prove the absence of such contagious particles. Those fallacies had been propagated in districts supplied with water from deep wells. It had been stated that zymotic disease of every kind which had arisen in these districts had been caused by the water alone, independently of imported contagion, or local nuisances. The fallacies were used for the purpose of assailing the character of deep-well water, and for resisting the establishment of waterworks which were often urgently required. It was argued by the authors of the fallacies in question, that water which might have been polluted by mischance or accident was not fit for public supply, because they said there were no safe provisions in nature for restoring it to a state fit to drink. Dr. Carpenter brought forth evidence, based upon personal experience, as well as the observations of others, to show that these ideas were dangerous fallacies. He also pointed out that two causes were generally at work in the establishment of an epidemic of enteric fever. First, there was a marked departure from the first sanitary law, by means of which the house of the victim was exposed to sewer contamination from defective sewers; and secondly, that the water-services were in immediate communication with the sewer system, by means of which an interchange of material took place, and thus typhoid germs gained admission.

Dr. J. Lane Notter next read a paper on the value of chemical and microscopical analysis in relation to the question treated of by Drs. Fergus and Carpenter.

Dr. Norman Kerr read a paper giving some typical cases of enteric fever, diarrhœa, scarlatina, and diphtheria arising from drinking-water; and

Dr. Martin (in the absence of Dr. Ballard) read that gentleman's paper giving some facts illustrative of the spread of these diseases.

Surgeon-General Crawford, Dublin, said he rose for the purpose of expressing his cordial thanks and that of the meeting to the gentlemen who had been so kind as to read those papers for the edification of those present, and for the instruction of the public at large. Coinciding as he did with regard to the remarks made as to the importance of a pure water-supply, and as to the great factor impure water was in promoting the diseases referred to, still he found from experience that more than once several forms of fever, typhoid, diphtheritic, and others, had arisen from other causes than impure water. After five years recently spent in India he had discovered that, and he did not mention it with the view of contradicting what the gentlemen who had read the papers had put forward, but for the purpose of inducing them and others to follow further the source of this, holding as he did that water alone would not account for the spread of contagion in all cases.

Dr. Fergus said he wished to make a few observations with reference to the remarks of Surgeon-General Crawford, who had raised a very important point. He (Dr. Fergus) and the other gentlemen who had addressed the meeting did not by any means wish to indicate that those diseases might not arise from other sources of impurity than contaminated water. But he held that the diseases under discussion arose almost invariably by taking into the system by air or by water human excrement in a state of decomposition. The question was how those noxious gases were conveyed into the houses, so as to cause an outbreak of fever. It got in in several ways; but the general opinion was that it was by the tension of the sewers, or by the suction powers of the openings into the drains, that it was conveyed into the houses. He (Dr. Fergus) was extremely puzzled for a long time to know how the air got into the houses. What led him to find it out was observing the decay of leaden pipes in houses, and the lead become affected on the outside and not on the inside,—on the upper surface where there was no water, and at places where no water could lodge. His opinion as to one of the means by which those foul gases got into the house was this, when they could not escape through the volume of water in the ordinary sanitary arrangements of closets, they were driven back through the supply pipes to the cistern, which in many cases supplied the house with water for dietetic purposes, and hence the cause of typhoid fever in many cases that were rather difficult to trace.

The President said the question that had been discussed by the various speakers was a very important one: as far as his experience went he knew cases of typhoid fever being caused by the gases being absorbed into exposed cisterns after passing through pipes, thereby contaminating the drinking-water for the house.

The Sanitary Museum was located in the new Plant-house, which, however, proved too small for the number of exhibits, and additional ground was taken in.

Those interested in the important subject of sewerage derived some instruction from the perusal of plans of a pneumatic sewage system, invented by Mr. Isaac Shone, C.E., mayor of Wrexham. By this process (described in the *Builder*, p. 781, *ante*) steam is not used, and the air is so applied as to force the sewage through the pipes. It is adapted for level districts. In connexion with this branch of the museum will be found sink-traps, contributed by Clarke, of Carlisle; Mitchel, of Dublin; and a model destructor for disposal of sewage, by Messrs. Manlove, Alliot, & Co., Nottingham.

Boyle & Son, Glasgow, have on view their air-pump ventilators, the object of which is to extract foul air from rooms, stores, or ships. The ventilator is fixed, and it is so constructed and the different parts so nicely adjusted that the gentlest breath of air impinging on it from any point produces motive power on the principle of the air-pump for extracting foul air. These ventilators have an advantage in being of a more tasteful design than these affairs usually have, and they will not disfigure any building to which they are attached.

Mr. William Barton, Boston, shows some fire-grates, and a feature of interest in this exhibit is the fact that the ornamental inlaid tiles are designed by students of the Cork School of Art,—namely, Mrs. Hill, Miss Baker, and Mr. Willis.

Messrs. Sibthorpe, Dublin, have on view a new plan of wall decoration, which is very effective. It is Isaac Walton's invention, and is an application of linoleum. Flowers and foliage are impressed with striking truth to nature. Woollams & Co., London, show specimens of wall-papering free from arsenic; and Goulding & Co., Cork, have samples of paint guaranteed non-poisonous, and adapted for painting hospital walls, &c. The "Sanitas" Company, of London, showed meat preserved by their fluid.

The Cork Gas Company has an exhibition which is full of interest in the present state of the public mind on the lighting question. Electricity, as a medium of illumination, though yet far from perfect, has had a most wholesome effect in waking up the gas manufacturers, and inducing them to efforts to improve their system and obtain the maximum amount of illumination which coal gas is capable of imparting. The strides made in this direction within a very few years is most striking, and the exhibits of the gas company in this museum show that the proportion of illuminating power which has been attained from gas does not compare unfavourably with the bright, though to a great extent uncertain, electric light.

The Museum of Sanitary Appliances, we should mention, is mainly under the charge of Mr. Arthur Hill, an Associate of the Institute of British Architects.

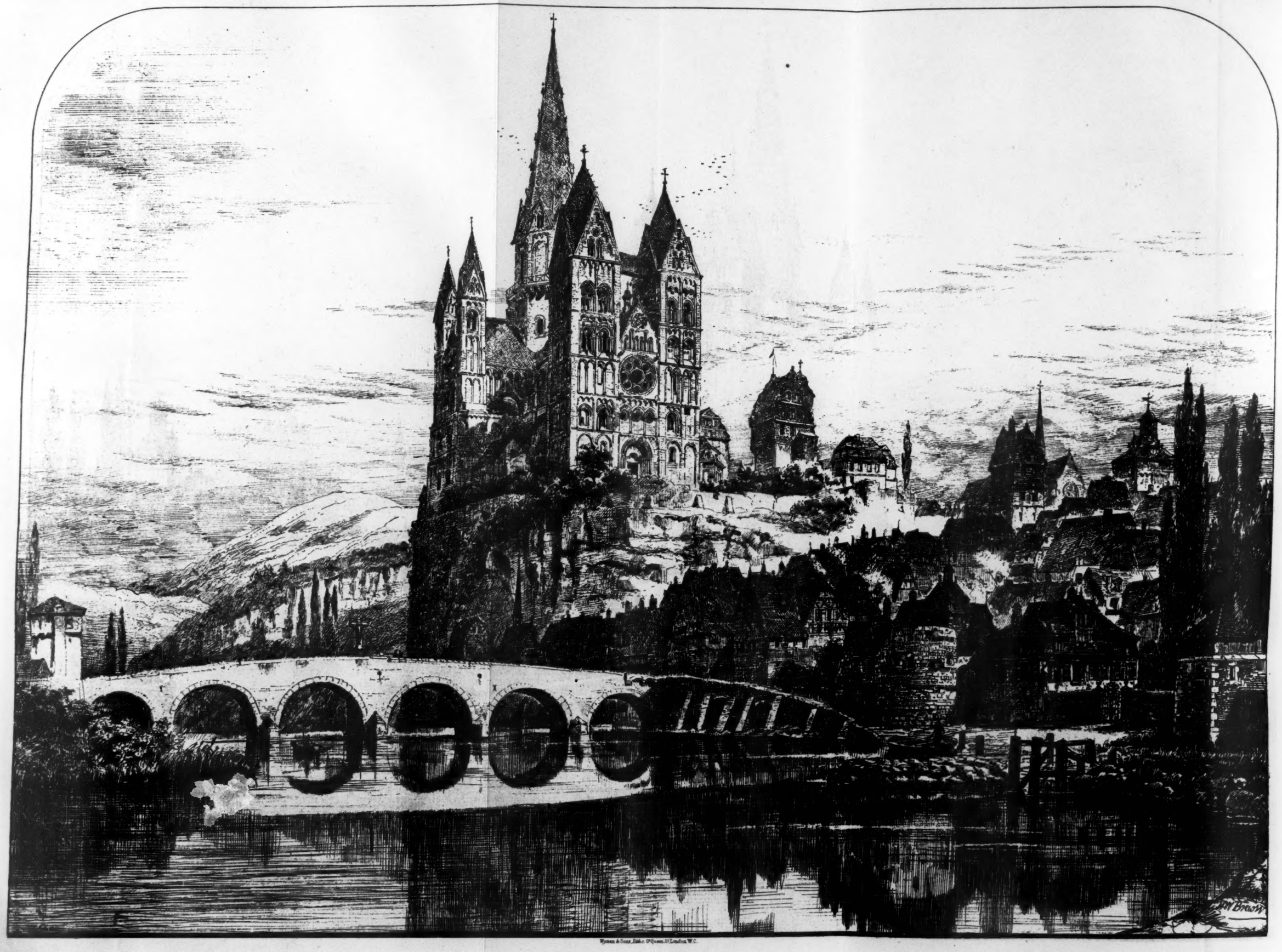
EPPING FOREST AND FOREST TREES.

It is not the works of man alone that deserve preservation. There are natural objects which it is almost as impossible to replace, if destroyed, or to make up for, as are antiques themselves, whatever they may be, or whatever the amount of mental interest they may in themselves possess. Many such things might be cited; but there is one especially which would seem at the present time to need special attention. We refer to the forests, so called, which are yet scattered about the land, every here and there, and which go so far to make up the scenery of the country, and to make of it a series of pictures as you pass through it. A very great deal, it is needless to say, might be written on so fertile a theme as this, so full is it of both science and art; but we must needs limit ourselves, and would just now say but a word or two, this being holiday time, on what is termed, strangely enough, Epping *"Forest."* All have heard of this famous forest, but not many, perhaps, have passed through it, or particularly observed the precise state it is now in, or still less have speculated on its former state, when forests were of more use and interest than they now are. It may, therefore, help matters, and do, may be, a little artistic service, to hint at the past and point to the present state of Epping Forest.

A forest, so the dictionaries tell us, and
special case before us it is quite necessa
note this, is an extensive tract of ground
grown with trees of one or several speci
with trees and underwood. Many fin
beautiful descriptions there are of fores
forest scenery; and many fine picture
drawings there are descriptive to the
parts of, and glimpses into, magnificent f
both at home and in other parts o
world where Nature does her work withou
or hindrance. We hardly need to do mor
barely allude to them, for they are all the
over, from the farthest north to the isla
the Pacific, and to South America, whe
Humboldt tells us, the forests are so thic
tree growth that it is impossible to find
way, and with a luxuriance of growt
would seem to defy all attempts at even th
them. Indeed, it would seem that this
tree growth has at all periods of the
history played no small part in it, and t
small island itself has fully borne its par
growing of trees, for there have been fo
trees in and over all parts of it, from
south. What we would now say a passi
about, and for, is but a very small
it. We allude to this Forest of Epp
close to London town,—so close, indee
it is sought to make of it a sort of
politan recreation-ground for holiday f
the public.

This Forest of Epping is, therefore, we
a little study and looking at, in an
sense certainly, and not only so, but as
of national interest. Others have thou
too, for in 1871 a Royal Commission
pointed to inquire into and ascertain th
boundaries of Epping Forest, and to
what, if any, "purprestures," "incroac
or "trespasses," had been made within
forest, and by whom, and when made,
now occupied, and as to whether the
rights and interests of her Majesty the
for it is a royal forest,—had been in
diminished, abridged, or otherwise pr
and, in short, to find out to the full
precise state of this royal forest now
date of the Commission, 1871,—is.
certain that nothing ever could, judg
present appearances, be more needful
A very accurate plan was obtained, an
true "boundaries" of the forest are at
and, it is curious to note, a "perambu
the supposed boundaries of the
waste lands and inclosures was, on se
made, when numerous parties attes
pointed out various matters relati
inclosures and boundaries of the f
may also be noted that before this
these recent days, a "perambulatio
days of Charles the First, was made
the boundaries of the forest were t
in accordance with the meets, meres,
bounds," as they existed in the twe
of King James I. The forest has
fore, been forgotten. The last and
is dated 17th of March, 1877.

The Commissioners, previously hav
tained approximately what were the
of the forest, and what were the
lands, and what were the lands encl
twenty years preceding, were obvi
position to see more clearly into t
state of things, and accordingly issue
—October 30, 1872,—prohibiting
from committing waste, injury, or
of or to the trees growing upon the
of the said forest, with but one or
exceptions, so that the total destruc
forest trees (for, strange to say, the
solitary specimen of a tree left)
accomplished fact before this date.
less, perhaps, to say how small this
is to what it was, and how muc
taken from it from time to time,
even from the days of Edward th
for many lords of manors have
claimed the right of inclosure, eve
date, and contended that they ha
living memory been interfered with
cise of their manorial rights, i
right to inclose. The wonder r
anything but the mere name of E
is left, but as we are here looking
in an artistic light, and sincerely
artistic loss of infinite moment, as
do not dwell on this, or go into
common," as it is called, and wh
has done so much harm; still
right, or supposed right, of "lopping



Wyman & Sons, Limited, 74 Queen St. London W.C.

LIMBURG-ON-THE-LAHN, GERMANY.

A forest, so the dictionaries tell us, and in the special case before us it is quite necessary to note this, is an extensive tract of ground overgrown with trees of one or several species, or with trees and underwood. Many fine and beautiful descriptions there are of forests and forest scenery; and many fine pictures and drawings there are descriptive to the eye of parts of, and glimpses into, magnificent forests, both at home and in other parts of the world where Nature does her work without help or hindrance. We hardly need to do more than barely allude to them, for they are all the world over, from the farthest north to the islands of the Pacific, and to South America, where, as Humboldt tells us, the forests are so thick with tree growth that it is impossible to find a pathway, and with a luxuriance of growth that would seem to defy all attempts at even thinning them. Indeed, it would seem that this mighty tree growth has at all periods of the earth's history played no small part in it, and this but small island itself has fully borne its part in the growing of trees, for there have been forests of trees in and over all parts of it, from north to south. What we would now say a passing word about, and for, is but a very small part of it. We allude to this Forest of Epping, so close to London town,—so close, indeed, that it is sought to make of it a sort of metropolitan recreation-ground for holiday folks and the public.

This Forest of Epping is, therefore, well worth a little study and looking at, in an artistic sense certainly, and not only so, but as a thing of national interest. Others have thought this, too, for in 1871 a Royal Commission was appointed to inquire into and ascertain the precise boundaries of Epping Forest, and to find out what, if any, "purprestures," "incroachments," or "trespasses," had been made within the said forest, and by whom, and when made, and how now occupied, and as to whether the forestal rights and interests of her Majesty the Queen,—for it is a royal forest,—had been in any way diminished, abridged, or otherwise prejudiced; and, in short, to find out to the full what the precise state of this royal forest now,—at the date of the Commission, 1871,—is. It is quite certain that nothing ever could, judging from present appearances, be more needful or useful. A very accurate plan was obtained, and thus the true "boundaries" of the forest are at once seen, and, it is curious to note, a "perambulation" of the supposed boundaries of the uninclosed waste lands and inclosures was, on several days, made, when numerous parties attended, who pointed out various matters relating to the inclosures and boundaries of the forest. It may also be noted that before this inquiry in these recent days, a "perambulation," in the days of Charles the First, was made, by which the boundaries of the forest were then settled in accordance with the meets, meres, limits, and bounds," as they existed in the twentieth year of King James I. The forest has not, therefore, been forgotten. The last and final report is dated 17th of March, 1877.

The Commissioners, previously having ascertained approximately what were the boundaries of the forest, and what were the open waste lands, and what were the lands enclosed in the twenty years preceding, were obviously in a position to see more clearly into the precise state of things, and accordingly issued an order, —October 30, 1872,—prohibiting all persons from committing waste, injury, or destruction of or to the trees growing upon the waste land of the said forest, with but one or two small exceptions, so that the total destruction of the forest trees (for, strange to say, there is not one solitary specimen of a tree left) was not an accomplished fact before this date. It is needless, perhaps, to say how small this forest now is to what it was, and how much has been taken from it from time to time, commencing even from the days of Edward the Confessor; for many lords of manors have successively claimed the right of inclosure, even from that date, and contended that they had not within living memory been interfered with in the exercise of their manorial rights, including the right to inclose. The wonder really is that anything but the mere name of Epping Forest is left, but as we are here looking at the matter in an artistic light, and sincerely deploring an artistic loss of infinite moment, as we think, we do not dwell on this, or go into the "right of common," as it is called, and which evidently has done so much harm; still less into the right, or supposed right, of "lopping and topping," which has in reality done still more mischief. Our main thought is with the total absence of all sign even of a forest tree, or trees, here. When we say that there is not a forest tree left, it is but truth to say that there is every here and there the mere stump of what was once on a time a goodly tree, but which is now, in consequence, doubtless, of this right of lopping and topping, nothing but a tree stump, without leaves or any sign of tree growth at all left. Indeed, as you look more and more closely, it becomes difficult to find out what "influence," to use the Commissioners' word, has accomplished the most mischief, or has done the most cruel public wrong.

We may here add that the Metropolitan Board of Works urged before the Commissioners, on behalf of the public, citing authorities, that the public had acquired a right of *wandering over* the forest at their pleasure, and using it for recreation and enjoyment. But the Commissioners of Her Majesty's Works and Public Buildings also urged, producing documentary evidence that the forest was still a *Royal Forest*, and that the forestal rights of the Crown still existed. A full and clear history of Epping Forest, from the earliest date, would be a thing of much interest, for it was submitted that the early kings passed to the grantees all the rights that the Crown then had, including forestal rights, and that they were thus wholly free from the operation of the forest laws. It may be noted that Epping Forest is now some six miles long by two miles wide, thus occupying twelve square miles of tree-growing space. But however interesting and profitable all such inquiries may be, they will most assuredly not get us out of our artistic difficulty, viz.,—the total absence of the *trees* of which we are so vainly in search. The poor rotten stumps every here and there yet left, the underwood, the tall grass in some places, the ever-present fern and other low wild plants, all good enough in their way, do not make a forest, and the disappointed artist can but again and again ask for the *trees* of Epping Forest, whoever owns it. Can nothing be done, it may be asked usefully? The Commissioners, after all their careful and detailed inquiries, came to the following conclusions, among others, as affecting the public, viz.,—that although the public have long wandered over the waste lands of Epping Forest without let or hindrance, no legal right can be found for such "user." But even this somewhat hard case for the unfortunate public might not altogether destroy our sense of the picturesque and the beautiful in forest-tree growth if it existed, for it might be viewed, as Turner viewed it, from a distance, but, as we say, it does not now exist. The main and practical conclusion is, that the Forest is to be kept open and uninclosed and unbuilt upon, and as an "open space," for the recreation and enjoyment of the public; and that the *natural aspect* of the Forest shall be preserved, and the ancient earthworks and other ancient remains shall be preserved. All good enough, but the Commissioners do not suggest any method whereby the old forest oak and other trees, which made it a forest, are to be again called into existence.

It would be, indeed, difficult to devise anything better than this of preserving the true forest character of the place rather than the making it into a sort of park. A park is one thing, and a forest is another. And we pause for a moment on it, inasmuch as there are several indications in the Commissioners' Report of a desire to inclose parts of it for a variety of purposes hardly within the generally-understood notions of a forest, however interpreted. Surely the very idea of a forest implies that Nature does the work, and that the wildness and irregularity of the tree-growth and the wild growth of the underwood are to be got at and kept only in this way. All that is needed is, that the ground itself be protected, and the growing vegetation, trees, and underwood be saved from wanton waste and destructive action. Nay, would not the very forest-trees again make an appearance, even as it is, and without help, if but time were afforded for it? Indeed, wonderful is it to note what kindly and untiring Nature will do, even in the most unlikely and unpromising spots, if left to do so unhindered and unhelped, and thus to do her own work in her own way. This all may occasionally see in unnoticed nooks and corners, and there find, too, what wonderfully beautiful forms, which even the highest art fails to rival or imitate, are produced,—no man knows how or whence. In the forest growth such are never absent.

LIMBURG-ON-THE-LAHN.

In describing Erfurt, with its marvellous "acropolis" crowned with magnificent churches, we alluded to Limburg-on-the-Lahn as presenting an equally wonderful appearance.

Rising quite precipitously from the river Lahn is an escarped rock, the opposite side of which has been cut away into a series of terraces, which gradually descend to the level plain. On the very edge of this precipice is placed the cathedral, or, as it was formerly called, the Collegiate Church of St. George, so close, indeed, is it to the escarped face of the rock that the buttresses of the north transept are exactly flush with it, and in the dim light of evening it is impossible to see where the church begins and the rock ends. This method of "broaching" a church down on to the rock upon which it stands was a very favourite device of the Middle Ages at Limburg,* Mont St. Michel, Durham, &c. The church seems to run down into the rock, and the rock to run up into the church, so that the effect is as though some vast rock had been carved and shaped into a church. The power this gives to a building is wonderful. Instead of, as is so often the case with buildings now, the site being a difficulty, it is made to add enormously to the dignity of the structure which stands upon it.

Most modern architects or builders, if they had such a site as that of Limburg Cathedral to erect buildings upon, would commence by cutting the rock down so as to gain a level platform for the buildings to rest upon, but it seems that the Mediæval men never did this. Whenever they did anything with earthwork it was to pile up, never to cut down. The idea of levelling a site seems never to have occurred to them, and if they wanted to put a building down upon a certain spot, they do not seem the least to have cared what was in the way. At Würzburg there is a church the west end of which is built over a stream, and the east end over a road. At Dettelbach the town-hall has a river running under it from north to south, and the principal street of the town from east to west. Probably the Germans were more daring in this respect than any other Mediæval builders; the fact is, they seem to have delighted in overcoming difficulties, and if there were no difficulties to be overcome, they sometimes seem to have almost gone out of the way to make them. That spirit of "adventure" for which the Middle Ages were so remarkable, that dislike of what was vapid or commonplace, that restless activity of mind always in search of the wonderful, longing for the supernatural and the mysterious, entered largely into their buildings and their choice of sites for their towns and churches. It may, of course, be advanced that defence had a good deal to do with the question, but no ideas of this kind could have dictated the choice of such a site as that of Limburg-on-the-Lahn, because there is immediately to the east a lofty hill with sloping side, and thus easy of ascent, which completely commands the town.

Perhaps no town in Germany possesses so romantic an appearance as Limburg when viewed from the river. Seen from the west, with the cathedral crowning the eminence, and the gables of the houses forming an intricate foreground, its simple but striking fourteenth-century bridge spanning the river, and lofty hills filling in the background, it is difficult to imagine a more charming scene than this quaint old city presents. Nor is the view from the east in any way less beautiful, for here the noble apse of the cathedral rises over some interesting ancient collegiate buildings, a picturesque old mill and some willows group themselves charmingly about the base of the rock, while, far above everything else, the seven graceful spires of the cathedral shoot up into the sky. When one sees these grand old towns one is led to question whether we have really improved; and if, after leaving Limburg, one finds oneself in Ems or Carlsruhe, the thought will naturally present itself that three centuries of civilisation have not improved our dwellings, at least as far as their external appearance is concerned. It is a very remarkable fact that, in passing judgment upon all ancient peoples, we take our views of their high civilisation or the reverse from the beauty of their buildings, more than, perhaps, from any other circumstance, but yet we never dare to apply the same test to

* Internal and external views of the Cathedral will be found in our previous volumes,—for 1873, p. 297, and for 1877, p. 1225.

ourselves. We acknowledge frankly that our domestic architecture would, as a rule, disgrace any nation of savages; that we see with horror the wretched rows of ill-built, badly-designed, undignified, and paltry houses, spreading out from our ugly, uninteresting, and vulgar-looking towns, destroying everything that is beautiful; splendid groups of trees cut down; the pleasant little brook or rivulet converted into a sewer or ditch; the charming fields converted into dull and hideous streets. The late Sir G. Scott said that it was a lamentable fact, that when our ancestors erected a house it added a beauty to the surrounding country, but now a new house is generally a plague-spot in the fair landscape.

The fact that so very few people seem now to care about or to appreciate the beauty of buildings is the commencement, if it is not stopped, of a serious danger in the future,—it is the beginning of a want of appreciation of the beautiful altogether; and that we are advancing pretty far on this dangerous road is proved by the proposed conversion of a Cumberland lake into a reservoir. The destruction of Springfield Park, Acton; the sweeping away of Rogers's house and gardens; the hideous transformation of Old Well-walk, Hampstead, and the needless destruction of fine trees everywhere in the neighbourhood of London,—all these show that it is not only in architecture and building that we have ceased to appreciate the beautiful, but that we care very little indeed for the beauties of nature.

If this want of interest in what is beautiful, this training our minds to get thoroughly used to ugliness, and to look upon the destruction of beautiful objects unmoved, and if the habit which of late years has been so largely on the increase of sneering and laughing at those who respect these things, is allowed to continue and to grow, it will in time become part of our nature, and we shall realise the triumph of dulness so admirably described by Pope in the "Dunciad," when,—

"Art after art goes out, and all is night."

NEW CONSERVATIVE CLUB BUILDINGS, PRESTWICH.

The directors of the Conservative Club, Prestwich, having decided to erect new club buildings, invited several Manchester architects to submit designs in competition. Those submitted by Mr. William Dawes have been selected, and tenders have been obtained for the works, which will be proceeded with at once under the architect's superintendence.

The buildings will be erected on a plot of land in Church-lane. They will comprise a large meeting and reading room, retiring-room, secretary's room, porter's living-rooms and office, with general conveniences, on the ground-floor; two billiard-rooms, card-room, lavatory, and bath-room, on the first-floor; and gymnasium, lavatories, wine and beer cellars, coal and wood stores, and heating-chamber, in the basement. The billiard-rooms will have a roof light in addition to the end and side lights, and will be fitted up with three tables. The gymnasium will be well lighted by large windows, opening into an area extending the whole length of the building. There will be three entrances on the ground-floor,—two opening into the front hall, and the other into the staircase landing to the gymnasium.

The buildings will be constructed of brick, with stone dressings. There will be a small tower at the corner nearest the main road.

FLITCROFT'S MONUMENT.

At the close of our volume for 1877* attention was drawn to the state of a small marble tablet affixed to the west wall of Teddington Church in memory of Henry Flitcroft, the architect of St. Giles's Church, London, and St. Olave's, Southwark. Under the kind superintendence of Dr. Hugh Diamond, F.S.A., who resides near the spot, this tablet has been repaired, and the Doctor writes,—"What has already existed for more than one century is now safe for another if allowed to rest untouched." The expense, which is trifling, we willingly defray.

Flitcroft, "who had the honour of having ye three first Princes of the House of Brunswick with him in the Board of Works, of which he was successively appointed Clerk, Master-mason, and Controller," was born September 8th, 1697, and died March 5th, 1769.

* See pp. 1169 and 1204.

TOWN HALL AND PUBLIC OFFICES, BARROW-IN-FURNESS.

A new town-hall and public offices for Barrow-in-Furness are in contemplation from the designs of Mr. W. H. Lynn, which were selected in competition some time ago. We give a view of the building as proposed to be completed, and plans of the principal floors.

The General Plan of the design consists of a front building and wings, which enclose a spacious courtyard 144 ft. by 122 ft. The fourth side of the quadrangle is bounded by the existing town-hall. The space immediately behind the present town-hall towards Market-street, and outside the main square of the site, is given to the fire department. The remainder of the Market-street wing is occupied by the police and court departments; these departments return along the front as far as the central entrance-tower. The other half of the front building, and the whole of the Cornwallis-street wing, are occupied by the municipal departments. The space between the end of this wing and the existing town-hall is enclosed by arched gateways, through which the court-yard is entered; and above these a corridor is formed, which connects the first floor of the new buildings with the large public-room of the present town-hall. The space fronting Market-street adjoining the fire department and opposite to these gateways forms the police and parade yard, with gates in the enclosing walls which afford a passage for police and other purposes from one street to the other. The present flagged footway along the side and back of the Town-hall Market area is preserved, and is divided from the courtyard by an iron railing with a gate at each extremity.

Municipal Department.—The accommodation required at present, with spare rooms in addition, is contained in the north half of the front building, and in the Cornwallis-street wing. The entrances are two in number. The council entrance leads directly to the council staircase, which occupies a position at the north angle of the quadrangle. This entrance and staircase lead directly to the council chamber lobby and corridor, to the committee-rooms, and to the private offices of the several departments. On the ground-floor, to the left of the council entrance, is a side-porch, or lobby, which leads to the waiting-room in the rates-office, so that those having only rate business to transact need not intrude on the building. The second, or public entrance to this wing, is placed at the end next the present Town-hall, and immediately adjoining it is the public staircase. From this entrance and staircase are approached the accountant-general's office on the ground-floor, the town clerk's general office on the first-floor, and the surveyor's clerk's office on the second-floor. These offices are all close to the staircase; and by this means the public are brought directly to where they have business to transact, without having to traverse the corridors of the building, these being reserved for official communication between the several departments. On the ground-floor, and adjoining the general office, are the other offices required for the accountant's department. The rates office is in the front building. The pay-office is placed on the right of the public entrance, with a separate entrance from the courtyard for the men, while the door between the pay-office and hall of public entrance will serve for the egress of the men when paid. Between the rates-office and the central hall are two large apartments unappropriated. Strong-rooms are provided on this and the other floors for the several departments.

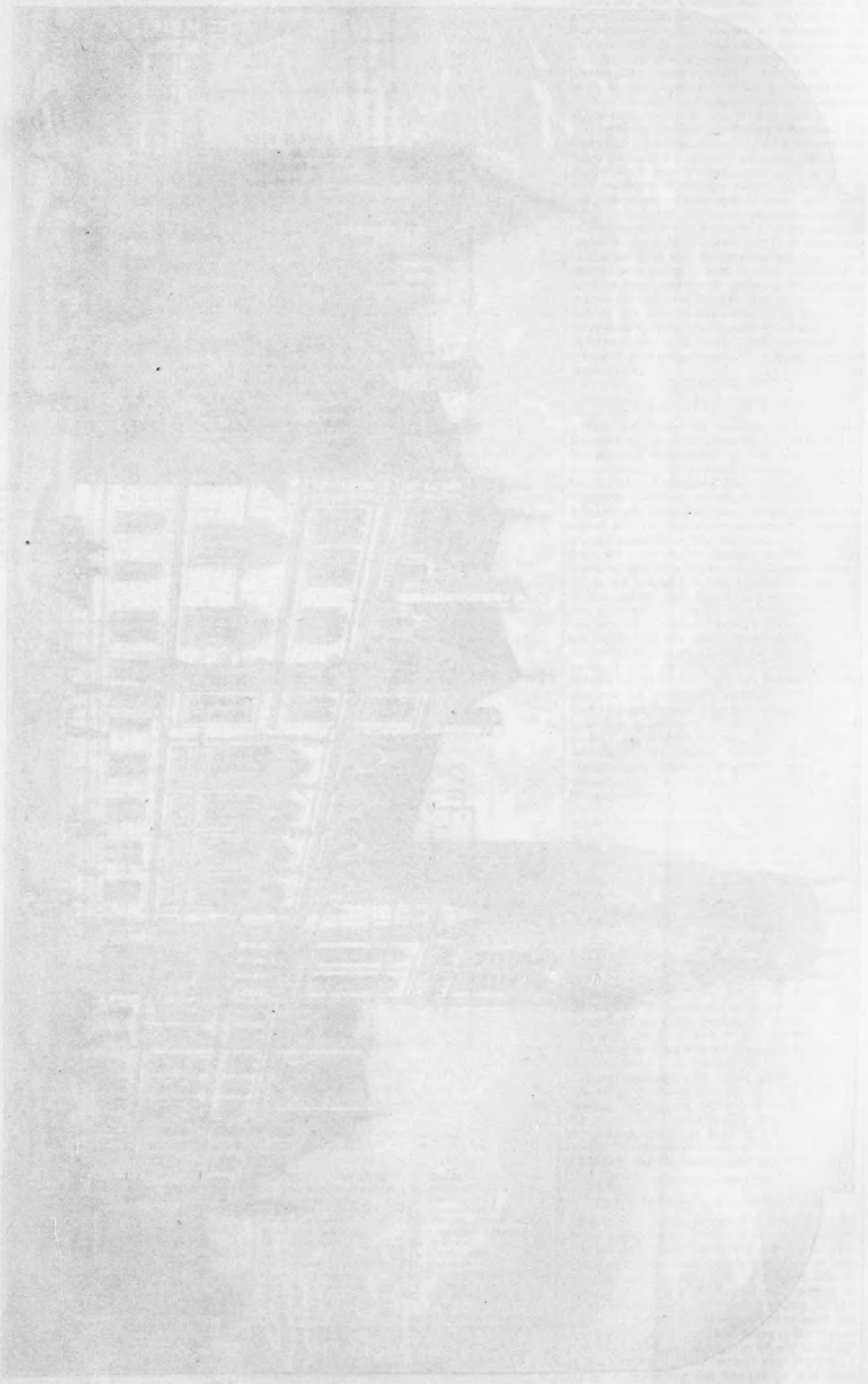
The town clerk's offices and committee-rooms occupy the first-floor of this wing, the private office being at the end next the council chamber, ante-room, and No. 1 committee-room. These three large apartments are in the front building, and are so arranged that they may be thrown together on special occasions by the opening of folding doors. The council chamber is carried through the second-floor.

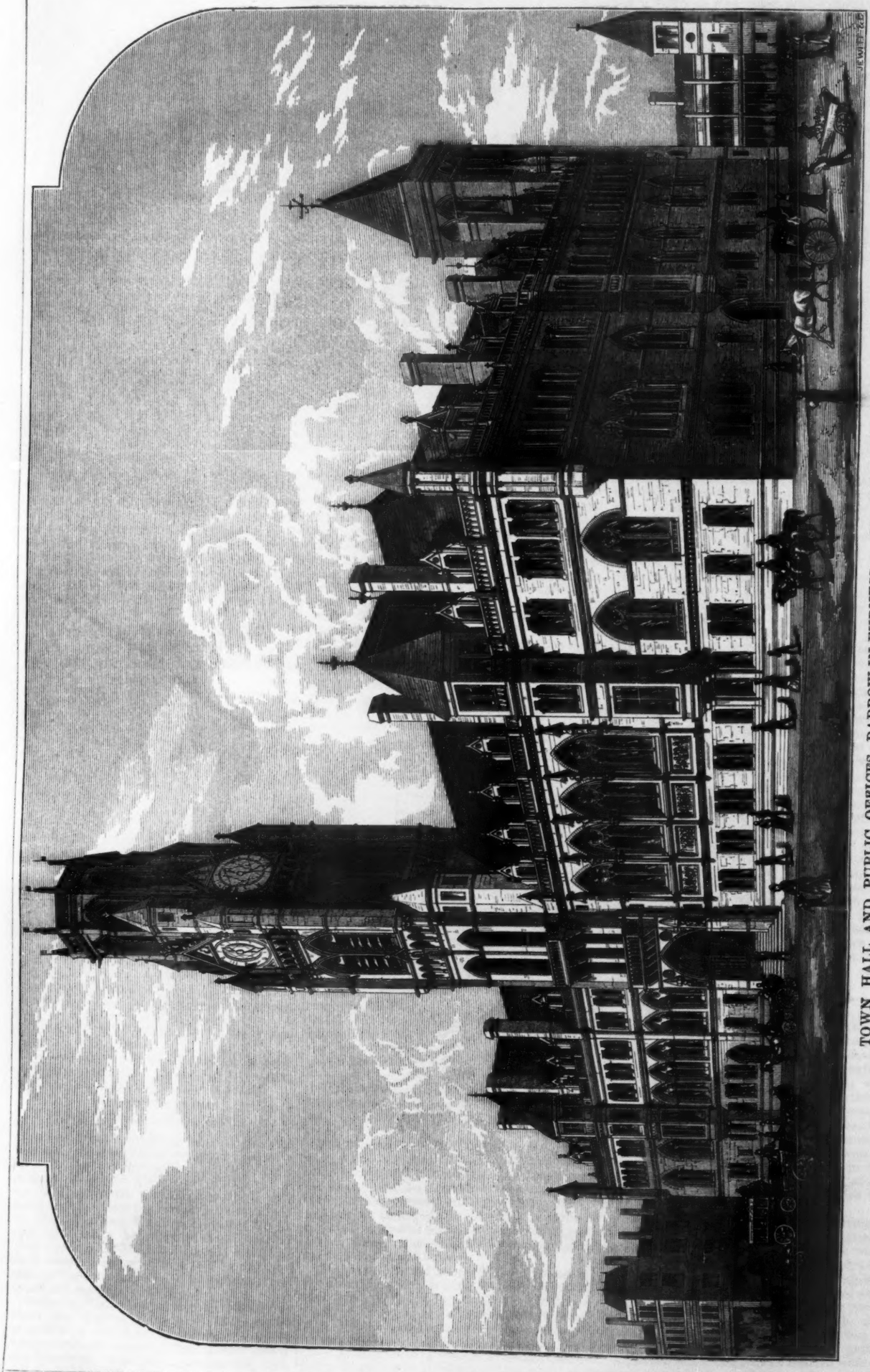
The surveyor's and other offices are placed on the second-floor of this wing, and are all within easy reach of the public staircase. The drawing office, with a room for contractors adjoining it, and a large fire-proof room for plans, is placed at the north angle of the front building. The style of roof adopted admits of an attic story being formed over the whole of this wing, approached by a continuation of the public staircase. The staircase space is further continued as a tower to receive the main cisterns for the water supply of the buildings. Provision is made for lavatories, water-closets, &c., on the several floors. Steps from the ground-floor of the public entrance-hall lead to a basement in which is provided coal-stores and a room for heating apparatus. From this level a lift for coals communicates with the several floors of the building.

The Police Department occupies the ground-floor at the east end of the front building and of the Market-street wing. The room for detectives is placed next to the central tower, with an entrance adjoining it, which also leads to a staircase-hall, from which the office of the police clerk is entered. The principal entrance to the police station is in Market-street. The day-room for the men adjoins the entrance-hall on the left; an inner hall leads to the charge-room, which has next to it on one side the clerk's office, already mentioned, and on the other the superintendent's private office. The prisoners' cells are entered from a corridor which runs alongside a police corridor, and extends to the police yard at the end of this wing. A bath-room is placed at the entrance end of the corridor. Lavatories, in addition, are provided in the approaches to the prisoners' exercise yard. This yard (80 ft. by 18 ft.) is placed immediately outside the cells. The greater portion of the yard is covered by a portion of the court department on the first floor. The front of the covered space faces the central courtyard, and is treated as an arcade, the arches being built up for about 7 ft. in height, and the upper portion filled with iron railing. The uncovered portion is inclosed by a wall of full height. The covered yard would have the advantage of being available for exercising purposes in all weathers, and, while admitting sufficient light and air to the cells, would screen these from view. From the prisoners' corridor an iron stair, with a railed-in landing, crossing the police corridor, communicates directly with the prisoners' dock in the court above. The opening between the prisoners' corridor and police corridor, where this stair is placed, is filled with an iron railing, to afford supervision of the prisoners' department from the police corridor and day-room. Iron gates at each end of the prisoners' corridor offer similar facilities from other points. An inside door from the police day-room opens into the police corridor, from which are approached the lavatories, water-closets, &c., for the men, the police stores, and also the kitchen and the stairs leading to the men's dining-room. A hatch for serving food to the prisoners is placed in the wall between the two corridors, opposite to the door of the kitchen. A private door, communicating with the police superintendent's residence, is also provided. The police yard is approached from the police corridor, and adjoining is an iron gate opening into the prisoners' corridor. The men's dining-room is placed immediately over the kitchen, with a lift between for serving dinner, in addition to the stairs approach. Next to the superintendent's residence, and at the end of the police and prisoners' corridors, is the police yard or parade ground (70 ft. by 23 ft.), into which the police van may be driven to take up or set down prisoners.

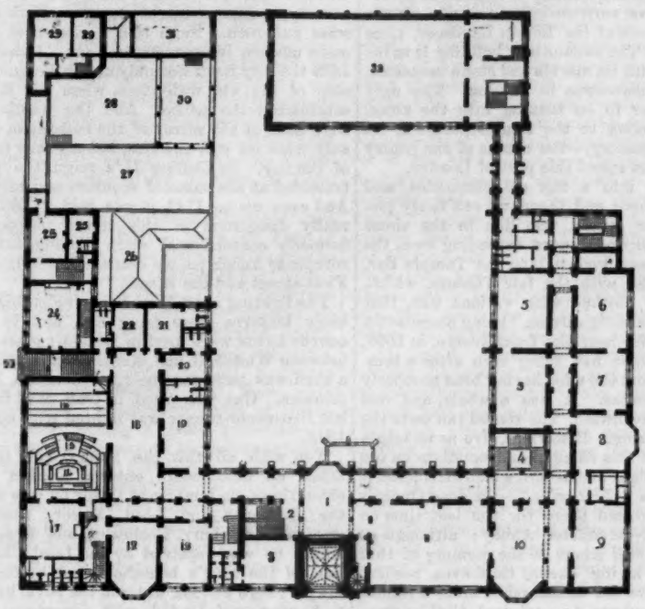
Fire Brigade Department.—Next to the police yard, and adjoining the market, is placed the Fire Brigade Department. The entrance to the yard is through a gateway corresponding to that of the police yard. The house for the fire-engines, with parade-room over, and the stables with loft, adjoin each other at the back portion of the yard. The superintendent's residence is placed next to the market front, and is designed in a tower form, to balance the tower termination to the present municipal offices at the angle of Lawson-street. The porch entrance to this department is carried up as a bell-tower, and is surmounted by a wooden belfry to receive the fire-bell.

Court Department.—The court department, on the first-floor, extends over the greater portion of the police department. The main entrance is in Market-street. From this entrance steps lead directly to a general waiting-hall (62 ft. by 20 ft.) for the use of professional men, witnesses, and others engaged about the court. From the landing outside the entrance to this hall steps on the right lead up to the portion of the court-room set apart for the general public or onlookers, which can thus be reached without passing through the business portions of the department. To the left of the same landing are lavatories, water-closets, &c., for general use.



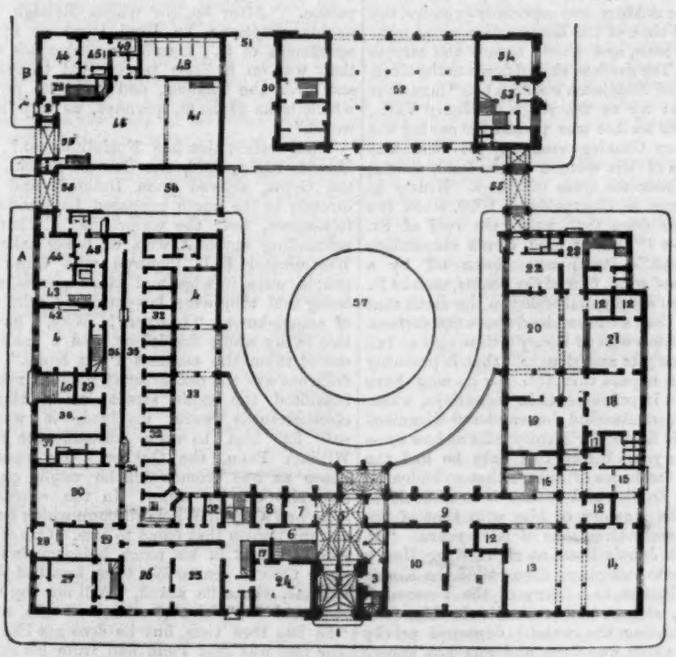


TOWN HALL AND PUBLIC OFFICES, BARROW-IN-FURNESS.—Mr. W. H. Lynn, Architect.



PRINCIPAL FLOOR PLAN

1. Central hall.
2. Central staircase.
3. Waiting-room.
4. Council staircase.
5. Committee-room.
6. Clerk's office.
7. Committee room or clerk.
8. Town Clerk's private office
9. Mayor's parlour.
10. Ante-room.
11. Council chamber.
12. Magistrates' rooms.
13. Magistrates' clerk.
14. Court.
15. Dock. 16. Public.
17. Jury-room.
18. General waiting-room.
19. Solicitors' room.
20. Female witnesses.
21. Male witnesses.
22. Police waiting.
23. Entrance to court.
24. Police dining-room.
25. Superintendent's house.
26. Roof over cells.
27. Police yard and parade.
28. Fire-brigade yard.
29. Fire Superintendent's residence.
30. Parade-room.
31. Loft.
32. Existing Public-hall.



GROUND PLAN

SCALE OF FEET

Ground Plan.

1. Central entrance.
2. Porch.
3. Burgesses' staircase.
4. Open yard.
5. Central hall.
6. Central stairs.
7. Porter.
8. Lost property.
9. Corridor.
10. Committee-room.
11. Spare office.
12. Strong-room.
13. Rates-office.
14. Public waiting-space.
15. Council entrance.
16. Council stairs.
17. Safe.
18. Private office.
19. Stock clerk.
20. Accountant's clerk's office.
21. Chief clerk.
22. Pay-office.
23. General entrance to offices.
24. Detectives' room.
25. Police clerk.
26. Charge-room.
27. Superintendent.
28. Police entrance.
29. Hall.
30. Police day-room.
31. Bath. 32. Cells.
33. Prisoners' airing-sheds.
34. Stairs to dock.
35. Prisoners' corridor.
36. Police corridor.
37. Police lavatory.
38. Police stores.
39. Store.
40. Entrance to court.
41. Police kitchen.
42. Lift.
43. Hall.
44. Parlour.
45. Kitchen.
46. Fire-brigade yard.
47. Engine-house.
48. Stable.
49. Scullery.
50. Residence.
51. Covered market.
52. Market space under present Town-hall.
53. Entrance.
54. Cloak-room.
55. Gateway.
56. Police yard and parade-ground.
57. Courtyards, 144 ft. by 122 ft.
A. Police Superintendent.
B. Fire Superintendent's house.

TOWN-HALL AND PUBLIC OFFICES, BARROW-IN-FURNESS.

To the left, on entering the waiting-hall, is placed the police waiting-room, and, next to it, rooms for witnesses in waiting. Instead of one common-room for witnesses, as suggested by the instructions, two have been provided,—for male and female witnesses respectively,—with separate lavatories and water-closets off them. Next to the witnesses' rooms is the solicitors' room, and opposite to the latter is the business entrance to the court.

Central Entrance.—The main entrance to the buildings, when complete, would be through the lower portion of a tower occupying the centre of the Duke-street front. The tower porch will be level with the street, and from it will be entered the ground-floor hall, from which the central staircase will lead to the hall on the first-floor. It also will afford a general entrance from Duke-street to the ground-floor of the building, and through the building to the central court-yard. The circular stair at the north angle of the tower leads to a burgesses' gallery formed over the lobby at the entrance end of the council-chamber. The stairs are carried further to a bell-chamber in the tower, and above that to a clock stage, the centre of the clock-face being about 130 ft. from the street level.

THE ART-UNION OF LONDON.

The Art-Union of London is now fairly installed in its new premises, No. 112, Strand. We gave a description of the new building, accompanied by a view and plans, in the *Builder* for the 4th of January last (pp. 19-21, *ante*). The new premises, of which Mr. E. M. Barry, R.A., is the architect, have been specially designed and are admirably adapted for the important purposes of the Art-Union. On the first floor are two capital picture-galleries. The larger of the two, known as the South Gallery, is top-lighted, and is nearly square, measuring 31 ft. by 27 ft. The North Gallery is a parallelogram, 31 ft. by 18 ft., extending the whole length of the Strand frontage on the first floor, and lighted by the three lofty circular-headed windows of that story. In these commodious galleries the pictures selected by the prize-holders of 1879 are now on exhibition. The pictures (of which we have previously given lists *) have been selected by the prizeholders from the exhibitions of the Royal Academy, Society of British Artists, Society of Lady-Artists, Water-colour Society, Institute of Water-colour Painters, the Crystal Palace Picture Gallery, &c. Altogether, 170 works are exhibited, and they form a collection which is well worth a visit. It will be of interest to note that while the money given by the Art-Union to the prizeholders for the purchase of works of art amounts, according to the catalogue, to 5,440*l.*, the actual amount paid to the artists for the works exhibited is 5,767*l.* 8*s.*, the difference being accounted for by the fact that in many instances prizeholders have added to the sum received from the Society in order to secure particular works.

It is desirable that it should be generally known that the cost of the new building does not encroach on the regular income of the Society. It is provided for by 2½ per cent. of the subscriptions, ordered to be reserved on the incorporation of the society by royal charter; from the profit on the sale of catalogues the exhibition; the amount unexpended by prize-holders; and the interest of the fund itself.

It may reasonably be hoped that the possession of a permanent exhibition of works of interest, forming a rallying-point for foreign and provincial friends visiting London, will not be without effect in making more generally known the objects and mode of operation of the Art-Union, and the advantages of membership.

THE STRAND: THEN AND NOW.

Mr. Editor,—The opening of the new galleries of the Art-Union of London is an event fraught with so much interest to the public, as providing the focus from which we hope to see ever-new ramifications and ever-fresh efforts emanate, that I, a mere "outsider," venture to ask for the insertion of a few words on the subject. Yourself, and the gentlemen associated with you in this work, have made it the object of such life-long and energetic efforts to carry out the intention with which you started,—that of "Promoting the knowledge and love

* See pp. 067, 812, *ante*.

of fine arts, and their general advancement in the British Empire by a wide diffusion of works of native artists, and to elevate art and encourage its professors by creating an increased demand for their works, and an improved taste on the part of the public,"—that we, the public, cannot but admit and praise the fact that this promise has been faithfully fulfilled. We see brought within the hope of the humblest home the prototype of things of beauty that are the fairest creations of the poets and the painters; and which hope, up to within the last few years, was as vain as the desire of the "moth for the star." But now a version of the "gem" that adorns the palace of some nobleman, or the mansion of a merchant-prince, may find its way through the community till it becomes familiar as a "household word." They even inspire some son of toil to soar above his chill surroundings, and, inscribing his name on the roll of fame, to exclaim, "I also am a painter."

And not only on English ground has the tree which has sprung from such a seed taken root and flourished. I assisted at the distribution of prizes which took place this year at the Lyceum, lent for the occasion by Mr. Irving, and the addresses of the prize-drawers ranged from the suburbs of London to California, China, America, and India. Lord Houghton wisely counselled those who had drawn prizes to weigh well their choice, mentioning the fact that more than one prizeholder had selected the picture of a rising artist, and that its value had afterwards trebled in amount.

Mr. Edward Barry, the professor of architecture at the Academy, has made the most of the space allotted him, and built a house which, with its mosaic landings, cool-looking green scagliola columns, and spacious rooms, is charming and appropriate.

There is so much worthy of notice in the Exhibition itself that it would seem almost invidious to notice one thing more than another, but naturally, on entering, the great prize gained by Mr. Mitchell, of Ballarat, catches the eye of any one familiar with mountain scenery by its sharp grey outlines and downfall of mist. It is a bit of Borrowdale, by Jas. Peel. In striking contrast is a bright morsel of Eastern life we had already noticed at the Academy, "The Door of a Mosque in Egypt," by Mr. Robertson. Then there is a pleasant idyll, suggested by a pretty girl in pink, with glimpses of green meadows and calm water, by Yeend King, who tells us the "Best of Friends must part." But wholly to our satisfaction, we meet again at "La Vereke, a Valley in Brittany." Then we have De Breanski's fairy-like "Water Hen's Haunt." Further on, a good moral lesson, "Evil Beginnings make Bad Endings"; then "A Glimpse of Venice," "Reminiscences of Wales," and quaint bits of fair France. All are so good we regret fleeting time; so, with a hasty look at the excellent model from Mr. Bell's "America," from the Hyde Park Memorial, our favourite "Wounded Warrior," and the new bust of Princess Alice, we pass on.

The Art-Union is to be congratulated on having been able to establish its home permanently on a spot so rich in historical recollections as the Strand. Unromantic though it may look, no street in London is more full of romance, which even the rapid rush of life in this century has not contrived to extinguish, and I venture to send a few memorials of it, not meant for the more profoundly erudite of your readers, to whom it would be a more than a twice-told tale, but to interest some of your subscribers in far-away countries, who have neither leisure, inclination, nor opportunity, to wade through big books.

When Dr. Johnson made his oft-quoted remark, "Let us take a walk down Fleet-street,' and which contained doubtless as many understood though unspoken injunctions as the celebrated nod of Lord Burleigh in the *Critic*,—a hint to us to keep our mind's eye open, and by blending past and present associations together turn a dull walk into a pleasant one,—he added, "the Strand is even more amusing still." Dr. Johnson himself would hardly be able to realise the rapid changes there of the last few years. Horace Walpole, in 1759, wrote to Montague, saying, "When do you come? If not soon, you will find a new town." What would he say now! Northumberland House, with the familiar lion and its amazing tail vanished; whilst, like Aladdin's palace, is springing up in what was the home of the Percys the huge handsome hotel that dwarfs the already dwarfish Trafalgar-square, though, if it leads to some improvement in that melancholy-looking monumental necropolis, and gives surroundings worthier of the magnificent work of Sir Edwin Landseer, none will regret it. The avenue now building is to be, we are told, with its marble and stone mansions, one of the handsomest in London. The ugly duckling seems to be turning into the swan. And yet we cling to the reminiscences of its Mediæval pageantry,—the aroma of the poetry that still lingers round this part of London.

By dipping into a few old chronicles, and culling a line here and there, we can fairly picture what the strand was like in the times when it was an open space extending from the site of what was known later as Temple Bar, running parallel with the fair Thames, which, then, was so stocked with various fish, that we hear of "ye silver salmon" being abundantly caught in it. We hear also from Evelyn, in 1658, of a much larger fish being seen after a tempestuous day, and the wind having been northerly nearly six months. It was a whale, and was caught near Greenwich. The strand ran on to the village of Charing. Historians give us no origin of the name of this village, and repudiate an old tradition as vulgar and absurd which attributed it to Edward I.'s "*chère reine*,"—the dear Queen's body having rested there for the last time on the way to Westminster Abbey; although so much poetry still clings to the memory of that beloved and loving queen, that even modern improvers have not disdained to erect a replica on the spot where her original Gothic cross once stood.

From the neighbouring heights several streams ran down which emptied themselves into the Thames at this spot. The country around must have been lovely. And roses seem to have been especially luxuriant in their growth here. In the course of ages, when the residence of the Court at Westminster became more frequent, Parliament being held there, the Strand became the site of many magnificent houses of the nobility, and especially prelates, the latter at the time of the Reformation numbering as many as nine, and whose names the streets still retain. The gardens sloped down to the river. At one period Middleton called it the "luxurious Strand," yet up to the reign of Henry VIII., when in 1532 an Act was passed for paving the way between Charing-cross and the Strand at the expense of the owners of the land, woeful must have been the state of things. Nearly as bad as it was in Cheapside in 1090, when the mud was so deep that when the roof of St. Mary-le-Bow ("Far as loud Bow's stupendous bells resound."—*Pope*) was blown off by a violent gale of wind, four of the beams, each 24 ft. long, were so deeply embedded in the earth that little more than 4 ft. remained above the surface. Indeed, London was in Henry's time still so full of "perilous pits and sloughs" that it probably induced him to pass this Act. Or he may have pondered on improvements in those days, when, like Haroun al Raschid, he wandered disguised amongst his lieges, for history tells us how some twenty-two years before this date he had the jollity and freshness of nature that so endeared him to the English and makes it so difficult to reconcile the memory of him with that of the harsh and embittered man of later years. "In 1510, on St. John's Even, at night, King Henry VIII. came to this place, then called the King's Head in Cheape, in a livery of the Yeoman of the Guard, with an halbert on his shoulder (and there beholding the watch) departed privily when the watch was done, and was not known to any but whom it pleased him. But on St. Peter's night following he and the queen came riding royally to the said place, and there with their nobles beheld the watch of the city and returned in the morning."

It is in that same year we hear of his going a-Maying. We quote it in modern spelling. Though well known, it is such a pretty story:—"On May-day, in the second year of his reign, A.D. 1510, his Grace being young and willing not to be idle, rose in the morning very early, to fetch May or green boughs, himself fresh, richly-apparelled, and clothed all his knights, esquires, and gentlemen in white satin, and all his guards and yeomen of the Crown in white sarcenet, and so went, every man with his bows and arrows, shooting in the woods, and so repaired every man to the court with a green bough in his cap, and at his returning many hearing of his going a-Maying were desirous to see him shoot, for at that time his Grace shot as strong and as great a length as any of his guard."

Up to 1762 people paved exactly as they liked, each inhabitant before his own door, and in such manner and with such materials as pride, poverty, or caprice might suggest. Kerb-stones were unknown. From that period most of our more modern improvements date. Indeed, till 1829 the City itself was only under the guardianship of the old watchmen, when Sir R. Peel established the police. And the public must have been at the mercy of the ruffianism of not only what we call rowdies, but also the dandies of the day. In Charles II.'s reign the people trembled at the name of scourers and mohocks. And even up to 1744, it was said, "London is really dangerous at this time; pickpockets, formerly content with mere filching, make no scruple to knock people down with bludgeons in Fleet-street and the Strand."

The lighting must have been deplorable. We know lanterns were hung out, and in 1694 convex lights were used in London; glass lights between Whitehall and Kensington in 1692, but a shed was built for their preservation during summer. Gas was used in Pall Mall in 1807, but Grosvenor-square was lighted with oil up to 1842.

Yet, with all this, the Strand held its own. When an ambassador entered London in the olden times, on landing at Dover he was met by the Governor and Lord Mayor; thence he went to Canterbury, Rochester, and Gravesend, where he was received by the Lord Chamberlain of the king's household, and by the Lord Mayor; here he took water in the royal barge up to London, and landed with ceremony at the Tower. Here the chief nobility, who were waiting to receive him, conducted him in great state through the chief streets of the City to the king at Westminster; his house was assigned him in the Strand, and when his embassy was over he was attended out of London in the same manner. We hear of Queen Elizabeth supping with Lord Burleigh at his house in the Strand in 1561. In 1583 he gave Durham House to Sir Walter Raleigh. Durham House was a noble palace. "After he, Sir Walter Raleigh, came to his greatness he lived there or in some apartment of it. I well remember his study, that was on a little turret that looked into and over the Thames, and had the prospect which is as pleasant, perhaps, as any in the world."

What celebrities has Norfolk-street? "On Monday night, 1690, the Czar of Russia, Peter the Great, arrived from Holland, and went directly to the house prepared for him in Norfolk-street, near the water-side." That most astounding autocrat, who, on being taken into Westminster Hall, inquired who those busy people were in wigs [and black gowns, and on being told they were lawyers, said, with a face of astonishment, "Lawyers! Why, I have but two in my whole dominions, and I shall hang one of them the moment I get home." Very different was the character of another man who inhabited the same street at a time his circumstances were involved,—it was not safe for him to walk abroad,—the famous William Penn, the Quaker. He chose the house as one from which he might on occasion slip out by water. In the entrance to it he had a peeping-hole through which he could see any person that came to him. One of those who had sent in his name, being made to wait more than a reasonable time, knocked for the servant, whom he asked, "Will not thy master see me?" "Friend," answered the servant, "he has seen thee, but he does not like thee." The fact was that Penn had from his situation taken a view of him, and found him to be a creditor. What wits, what scholars, here congregated at various times!

George Sale, translator of the Koran, and Congreve, the dramatist, were known in Surrey-street. Sturdy old Samuel Johnson's first lodging was in Exeter-street. "I dined," said he, "very well for eightpence, with very good company, at the 'Pine Apple,' in New-street, just by. Some of them had travelled. They expected to meet every day, but did not know one another's names. It used to cost the rest a shilling, for they drank wine; but I had a cut of meat for sixpence, and bread a penny, and gave the waiter a penny, so that I was quite well served,—nay, better than the rest, for they gave the waiter nothing." Speaking of a particular part in his play of "Irene," he says, "that speech I wrote in a garret in Exeter-street"; and at No. 40, Essex-street, he established a little club, called occasionally "Sam's," of which he observed, "The terms were lax, and the expenses light." They were to meet thrice a week, and he who did not come

forfeited 3d. Very blithely, too, does he relate how one evening he and Savage walked round St. James's-square for want of a lodging; they were not at all depressed by their situation, but in high spirits, and brimful of patriotism, and traversed the square for several hours inveighing against the ministers, and resolving they would "stand by their country." Howard-street adds its darker shade to all this, for here poor Mountford was set on and killed by Capt. Hill and Lord Mohun.

The "Ship" was an inn given with other lands to Sir Christopher Hatton; there we hear of William Faithorne, the celebrated engraver, who had set up a new shop at the sign of the "Ship," next the "Drake," opposite to the "Palsgrave Head" tavern, and there not only followed his art, but sold Italian, Dutch, and English prints. He, as all know, chiefly engraved portraits, amongst which are noted those of Henrietta Maria, Milton, and Fairfax, and these were an improvement, probably, on those of Queen Elizabeth, who having a most praiseworthy dislike to being presented to her loving subjects as a fright, made Cecil draw up a proclamation about her "Portraictures," saying that as none had expressed the naturell representation of her majesty's person, favour, or grace, they were to forbear from painting or graining her till some "cōnyng and speciall person" had done a good enough one for them to copy.

Then there was the new Exchange in the Strand, or Britain's Burse,—"a kind of Soho Bazaar." It had been opened by James I., and rather supplanted, after the Restoration, the old Exchange in the City. It was so popular in the days of Charles II. that almost every dramatist mentions it. It was the resort of the gallants and fair ladies of the day, and our old friend Pepys was frequently to be seen there. There the first edition of "Othello" was sold by Thomas Walkly. "There, at the sign of the Spanish Gypsies, lived John Radford and his wife, the daughter of John Clarges (a farrier in the Savoy); they sold powder, wash-balls, glosses; and this same Nan Clarges Radford became later Duchess of Albemarle, and is interred in Westminster Abbey; and here at the Revolution sat for a few days the widowed Duchess of Tyrconnell, who, reduced to absolute want on her arrival in England, and unable to procure access to her family, hired one of the stalls, and maintained herself by the sale of small articles of haberdashery. She wore a white dress, wrapping her whole person, and a white mask, which she never removed." The Exchange was on the site of part of Durham House and part of the present Adelphi. Soon after the death of Anne, in 1737, it was taken down.

No need to tell that there is at No. 5, Strand-lane an ancient Roman bath. The clear cold water (used for drinking only) probably flows from the old "Holy well," situated on the north side of the Strand, and lending its name to the adjacent Holywell-street, where now stands the Church of St. Mary-le-Strand, built by Gibbs in 1717, on the spot where stood in olden times the celebrated May-pole. May-poles and May-day had long been the delight of the English. The Church of St. Andrew the Apostle, in the ward of Aldgate, was known from other churches by the name and addition of *Knape* or *Undershaft*, "because that of old time every yeere on May-day in the morning it was that an high shaft or May-pole be set up there before the south doore of the sayde church, which pole, when it was set on end and fixed on the ground, was higher than the church steeple. But in the third year of Edward VI.'s reign, a fanatic curate, 'Sir Stephen,' preached against it at Paul's Cross." The last pole erected was this in the Strand, 1661. It was so tall that the Duke of York had to lend twelve able seamen to help elevate it; it was 134 ft. high, and was clasped and bound about with iron, and the crown and vane, with the king's arms, richly gilded, were on the top. In 1634, a Captain Baily set up a stand of four hackney-coaches near the Maypole, with instructions at what rates they were to take passengers. This proved so successful that there was a "rush" of other hackney coachmen, and soon twenty stood about there. In the reign of Anne the Maypole was ordered to be taken down. Sir Isaac Newton got possession of it, and erected it in the grounds of Sir R. Child at Wanstead, for the raising of a telescope. In olden days we must suppose there really was fine weather in England for that early in the spring, for Mayday was an especial favourite as a holiday.

James I. and Charles I. fought strenuously against the ultra-Puritanical spirit that was beginning to creep over the age, and Charles issued a proclamation permitting all lawful sports on the Sabbath, provided always that every partaker in them had attended divine service first,—a proclamation worth a comment; but I have already encroached too much on your valuable space. I should say no more, but looking out of the Art-Union council-room window I see the "Savoy Chapel," dedicated to St. John the Baptist, and built during the reigns of Henry VII. and Henry VIII., on the site of the ancient Savoy Palace. This building (one of the Chapels Royal) was seriously injured by fire in 1864, but has since been restored by the Queen, as you have doubtless told. Savoy Palace was first built in 1245, and was given by Henry III. to Peter Count of Savoy, the uncle of his queen, Eleanor of Provence. It stood between the present chapel and the river, but has entirely disappeared. John, king of France, was confined here after the battle of Poictiers, 1356; and, after his release, came on a visit, and died in the palace. When the Savoy was in the possession of old John of Gaunt, it was burnt and destroyed by Wat Tyler and his rebels. The Savoy was long neglected and saw many changes. In 1581 Fleetwood, the recorder, describes it in a letter to Lord Burleigh as a nursery of "rogues and masterless men." It was an Alsatia with a sort of right of sanctuary for debtors.

The German Chapel, which used to stand contiguous to the Savoy Chapel, was removed in widening Savoy-street, which now forms a thoroughfare to the Thames Embankment.

All now has disappeared. Of the palace—the scene of so many vicissitudes, of so much alternate splendour and squalor, the arena for the exhibition of so many fierce human passions,—not a stone remains; and as I gaze from the window of the council-room on the quiet little Gothic church and the green "God's Acre" round it, with its softly waving trees, and not far off the flowing Thames, it occurs that a fairer palace has arisen in the neighbourhood of the old one,—a palace of art,—where the only warfare that will be waged is that of beauty and truth, with their elevating influences, against old superstitions and old uglinesses.

I turn regretfully from the peaceful spot on which the calm of ages past and gone lingers, and step once more into that busy thoroughfare through which the ever-rolling mighty stream of human life is rushing,—whither?

"For evermore towards Temple Bar
A mighty music rolls,
A troublous motion, urging on
The march of human souls;
The City palpitates around
With streets that seethe and roar,
And still that living sea of sound
Aches to an unseen shore."

"O City poet! darkly veil'd,
Unveil thy secret heart,
Breathe out thy song of toil and show,
The prophet that thou art;
Sing life is equal in us all,
Blind arms stretch'd out in air
To touch the robe of Beauty, who
Is with us unaware."

Through what is being done for the diffusion of art in these days, beauty is placed within the reach of all. It is no longer an impossible attainment except to the wealthy; and to you and to your colleagues all must wish the success such endeavours to diffuse it deserve. Of any work, be it great or humble, when it tends to the good of the community and not of self, one may say "*sic itur ad astra*,"—so men attain the stars, and found for themselves monuments more "endurable than brass." C.

THE YARMOUTH MEETING OF THE BRITISH ARCHÆOLOGICAL ASSOCIATION.

The thirty-sixth annual congress of the British Archæological Association commenced at Great Yarmouth on Monday last, under the presidency of Lord Waveney. The inaugural proceedings took place in the Town-hall, and after the members had been welcomed by the Mayor, on behalf of the corporation and the townsmen,

Lord Waveney proceeded to deliver his presidential address. After some introductory observations, thanking the members of the Association for the honour done him by electing him as the president of the congress, his lordship went on to say that the tendency of the age was in two directions,—the one that in which archæology found its principal object and scope, and the other that which carried them forward with an accelerated pace. While they were endeavouring to develop the mightier powers of nature in their manifestations of steam and electricity, and motive forces in various directions, thoughtful attention had been paid to tracing back, step by step, the progress of our race from the earliest recorded times. In this fortunate age the analytic and the synthetic elements mutually assisted each other. Most of the applied sciences tended in a remarkable degree to help to trace out the steps by which they had arrived at their present point of knowledge. The discovery of geology, critical philology, and comparative anatomy lent their astute discrimination and searching glance in that direction, till they arrived at the mysterious barrier where they learned nothing of man, save that he existed to be developed for the purpose for which he was created. Beyond the walls of space which encircled the globe they knew nothing certain. Endeavours had been made to give them some insight into the history of their forefathers in the remote past. A great speculative philosopher had endeavoured to trace back the origin and accretion of man upon that faint streak of light in the distant and pre-historic past. But it appeared to him that they would exercise a wise and thoughtful humility in pursuing such researches to the bounds of physical science, and the inductions and references they permit; but beyond that they must pause and wait humbly and hope for knowledge. Archæological knowledge was of two sorts,—the positive, which might be seen and traced step by step by the touch of the hand; and the comparative, which must be based mainly on inference, guided by a power of assimilating likelihoods, and inferring from thence what could not be seen. The greatest discovery in astronomical knowledge made in recent years was by the exercise of indomitable perseverance and that marvellous faculty which, showing that certain perturbations existed, inferred some perturbing body here or there, and the planet Neptune swept into our ken. The greatest reward of inferential archæology was in discovering on the wild wastes of the Roman Campagna, the sites of cities coeval with the foundation of ancient Rome; of discovering on the Hampshire downs the buried villas of the Roman colonists; of tracing around a railway station the vallum and rampart which held the Roman legions during their occupation; and of discovering, in the neighbourhood of an old presbytery of the Templars or Knights of St. John, where the tilt-yard might be found. It had been an object of inquiry for many years among the Roman antiquaries as to which might be the site of that famous Latin city called Politorium, destroyed by Coriolanus. The general position was known, and it was known also that it had become absorbed into one of the greatest estates of the Roman patricians, in which so many antiquities were confused. The search was specially confided to him, and for three days, at a distance of ten miles from Rome, he pursued his task with confidence until the evening of the third, when, as he mounted his horse, he turned towards the setting sun and looked once more on the level Campagna: by the aid of the sinking orb he saw distinctly drawn out the whole plan of the city, with ditches, bridges, and ramparts. In geodesic science it was an axiom that where the hand of man had once been the mark was never effaced. Where man once placed the stamp of his imperial signature that writing and record would remain as long as time to bear witness to the fact. At the angles of the fields on the Hampshire and Berkshire downs some then present might have seen elevated parallelograms of more or less accuracy, which represented the superstructures of the old Roman villas, with their covering of earth and ashes when destroyed in some inroad of the colonists or when abandoned to decay. The outlines which marked the enclosure of the buildings, however, remained undisturbed to the present day. Wherever such elevations were, he believed, excavation would bring Roman remains to light. It required what he might call a "fanaticism of appropriation" to be certain that one was on Roman ground. Let any one observe the formation of the ground in the vicinity of the railway station at Chesterford,—a name indicating the existence of a camp in the neighbourhood,—and there would be distinctly seen the angles of the *castra* which, situate near a ford, gave the name to the place. When looking over the presbytery of the Templars at Hitchin some time ago he was convinced that an

elliptic enclosure there formed the tilting-yard, and that a hedge occupied the placeof the barrier. That was the thirty-sixth annual meeting of the Association, and it was the third time that they had met in East Anglia, having assembled once at Norwich and once at Ipswich. He congratulated the British Archæological Association on coming to a district of so varied a character, in which at one time land and sea had been so blended together that there was great opportunity there for exercising the discriminating skill of which he had spoken,—a district known to the commerce of Europe when the greater part of England languished in an undeveloped state, — a district through which military roads,—the blessed highways of commerce, and the sacred paths of pilgrimages,—passed in every direction, almost before their own history was formed into shape,—a district in which the sea had worked its ravages, carrying away, even in our own time, rood after rood of the solid land, leaving bare cliffs, where were great centres of commerce, over the ruins of which they would pass in course of their expedition. An admirable article which appeared some time ago in the *Edinburgh Review*, on the Paston letters, said that anciently a large portion of power belonged to the county of Norfolk,—and, of course, to Suffolk too, as connected with it,—which then occupied a larger relative position to the rest of England than it did now. Did they seek to know what manner of commerce met these shores in the low-lying lands of the Dutchman and the Belgian? It was at first a commerce, not of peace and of interchange for mutual benefit, but of war and javelins. The theory which attributed the stockading and moating of a large number of Suffolk houses on the coast-line was to protect the inhabitants from the predatory invasions of the Norsemen up the estuaries which had since been stopped, and which in that time enabled the invaders to enter the country to make inroads. The houses continued to be stockaded and moated as they had been in Saxon times. Did they wish to know what succeeded that sad time? There was the great city of Dunwich, Framlingham, the great staple town of the woollen trade, and Yarmouth, with a merchant navy that was paramount on the seas, and thus made nearer to the Continent than Norwich. Then there were the pilgrimages to Walsingham and South Elmham, and athwart the country to the interior, all commencing with the shores, but all passing inwards to carry with them the blessed influences of civilisation. In the first instance they were traced out by those Burgundian pioneers of Christianity who had left marks of their presence through the land. The mighty empire of Rome was a power which stood apart from all others of the ancient world; so vast and peculiar were its operations, so resistless in its efforts as to be almost independent of chronology. Go where they might, traces of that great people would be found, and he believed if search were made, that Roman camps or stations would be discovered in places which at present were not thought to possess them. A gentleman, an acquaintance of his at Bungay, had pointed out to him the neighbourhood of the Church of St. Lawrence, Ilketshall, as the site of what was once a Roman camp. Sir John Boileau had also shown him a similar place just north-east of Wymondham, and he was convinced such posts were placed within trumpet-call for the purpose of arousing the soldiers to resist the great outbursts of the wrath of the Iceni. In modern time the citizens of the United States had, in a similar manner, carried on their journeys from point to point, despite the opposition of the Indians. On Thursday he hoped to be honoured at his residence with the presence of many who were at the opening meeting, and he intended to show a remarkable instance of the two civilisations brought together,—a church within a Roman camp, and that church a most remarkable one. Speaking of manors and churches, the noble president expressed gratitude to Mr. Danby Palmer for two splendid volumes of etchings by Cotman, of the Norwich school; referred with terms of admiration to that school and its work; and concluded by touching upon various places of interest which would be visited.

A vote of thanks to the President for his address was heartily adopted, on the motion of Mr. T. Morgan. After some formal business, a large party, under the guidance of Dr. Raven, perambulated the town, first visiting what is known as "Carter's Mansion," No. 4, South Quay, the residence of Mr. C. J. Palmer, F.S.A. It was erected in 1596. A break in the perambulation was made at the house of Dr. Aldred, where tea was served on the lawn; but the walk was soon resumed. Keeping within the wall, between which and the sea in Mediæval times there was a wide expanse of Denes, the party proceeded to examine the remains of the Benedictine Priory, near the church, and the site of the north gate, and to follow the line of the wall to the side of the Bure.

In the evening a public dinner was provided at the Star Hotel, for about 120 ladies and gentlemen. Lord Waveney presided, and the Mayor, Mr. J. J. Colman, M.P., Mr. E. Birkbeck, M.P., Sir W. Stirling, bart., and the Vicar were among the company present.

Tuesday was a "carriage day," and at half-past nine in the morning a large party started for Caister, where excavations had been made on the site of the Roman camp. When the party had assembled round the exposed portion of the remains, Dr. Raven remarked that it was a matter of dispute whether the Roman station of Garianonum was at Caister or at Burgh. Sir H. Spelman favoured the view that it was at Caister. A Roman kiln had been found in the neighbourhood. It was 4 ft. square. Much Roman pottery had also been turned up, together with an iron stand, on which the sun-baked urns were placed. A paper descriptive of this kiln and of the pottery, by Mr. J. Gunn, was read by Dr. Raven. Among the fragments of pottery were shown some bones, principally tibiæ, which had sharpened ends.

A short drive brought the party to Caister Castle, a ruin which forms, with its lofty tower, a picturesque object in the well-wooded landscape. Here Mr. Loftus Brock made some observations on the town of Caister. In the Saxon period there was a church here, the site of which is marked to the present day by a tower. That early church was given by Edward the Confessor to the Abbey of St. Benet. The present parish church was built about 1300. Caister Castle is, however, the most interesting structure in the district. It is so like the older castles which preceded the days of Sir John Fastolf, who built it, that Mr. Loftus Brock believes Sir John Fastolf utilised the moat of an older fortress. The building was deserving of careful study, because it illustrated the point advanced by the president in his inaugural address that the dwelling-houses of Norfolk and Suffolk were moated so as to enable them to resist any piratical descent from the coast. Caister Castle had more of the features of a castellated manor-house than was usual in buildings of the same period. An interesting paper by Miss Haddon gave an account of the principal personages connected with the castle.

The party next proceeded to Filby Church. There was a church here, said Mr. Loftus Brock, as early as the second year of King John, a church that may have been founded long anterior to the time of that monarch. A record of presentation in the time of Edward III. shows that the manor had then passed into the hands of a family named De Filby. These references of presentations to rectors are always of great interest in the elucidation of the history of a church. The phases of architecture may also be frequently marked by them, for whenever a church became vested in a family they would look after the fabric. Filby Church bears evidence of a second change. Mr. Brock attributes to the middle of the fourteenth century the nave arches, the external walls, the south doorway, and the walls of the chancel. The aisle-windows of the church, which belong to the early part of the fifteenth century, differ from those of the north aisle, which are probably of the same date as the nave arches. The most interesting object in the church is the remaining portion of the rood-screen. Norfolk churches abounded with rich ornamental woodwork, erected at great expense; and this screen at Filby is a remarkable example. In the series of paintings on the lower panels, the work of the fifth century, the figures bear comparison with the best of those to be found in Norfolk and Suffolk. Mr. Brock said that these figures are indeed as good as in any painting France, or even Italy, can produce of that character. The figures are lifelike; the attitudes for the period anything but stiff, and the colour excellent. The figures are those of SS. Cecily, George, Catherine, Peter, Paul, Margaret, Michael, and Barbara.

We shall continue our notes of the congress next week.

THE ROYAL ARCHÆOLOGICAL INSTITUTE AT TAUNTON.*

As we mentioned last week, a paper was read before the Architectural Section, by Sir Charles Anderson, on "Towers." He said the Tower of Babel was the parent of that form of building, and they owed their origin to the desire which men felt to get nearer the sky. Some of the earlier towers were civic monuments, but in most cases they were ecclesiastical structures, and were near the church, or connected with it. In Italy they were generally detached. Round towers were the earliest ecclesiastical specimens in the north of Europe and Ireland. He thought they were not intended for bells, but probably for the sake of exhibiting a light at night, and for watching purposes. He instanced many towers at home and abroad, and explained their characteristics, adding that he believed their effect was watched from the bottom as they were built, and that in the case of some of the most beautiful structures shams were erected to judge of the effect of the building when it was complete. Cathedral towers are generally added to or finished with wooden spires, covered with lead. Every tower had what is called a physiognomy of its own. The windows formed the eyes, and the string-course above the eyebrows. A double belfry-window was infinitely superior to any other for towers. Much depended for effect on the position of the windows, and the space between them and the top of the tower. The tendency in modern times was to raise the pinnacles too high. The pinnacles at Bath Abbey, for instance, had much better be away. The finest towers were Lincoln, Canterbury, and Gloucester. Canterbury and Gloucester had the advantage over Lincoln in possessing very fine pinnacles. The York centre-tower was very fine, but it was unfinished. No doubt it was intended to have an upper story like Durham, but the foundation was not strong enough, and it was left alone. The west towers of Wells were amongst the most beautiful they had. He supposed it was intended to have wooden spires to these, but they were very handsome without them. Of spires, Salisbury stood first. Louth, Coventry, Newark, and Grantham, and a number in Northamptonshire, came next. As to foreign spires, he placed Mechlin first, and Strasbourg was the finest in the world of its kind, being so light that it really looked at a distance as if it were transparent, much like the noble tower of St. Mary's in Taunton.

On Wednesday, the 6th inst., a party numbering about 200 of the members and friends of the Institute left Taunton Station for Washford, *en route* to Cleeve Abbey, where Mr. Fairless Barber acted as *cicerone*. He prefaced his description of the ruins by a brief explanation of the disposition of Cistercian abbey buildings, and pointed out that the range of apartments on the south side of the cloister-garth were of later date than the rest of the buildings, and that the windows which lighted those apartments were especially beautiful. At the south-east end of the church Mr. Barber pointed out the door which led to the sacristy, where the vessels connected with the administration of the mass were kept. Leading from this was a room which had been marked on Mr. Mackenzie Walcott's plan as a parlour, but which some thought was the room in which the bodies of dead monks were placed before interment. It was suggested also that it was a place where refractory monks were kept in silence, which would be a very different thing from a parlour. Next to this apartment they came to the chapter-house, a room with quadripartite vaulting in two spans, on which, Mr. Barber pointed out, there still existed traces of mural decoration in polychromy. They then came to a very handsome spiral staircase leading to the dormitory. Mr. Walcott, in his otherwise very admirable remarks on this abbey, stated that near this staircase was the library. Now, it was well known that the members of the Cistercian order were not allowed to have many books. They next came to the slype, or covered way. On the right of the slype they entered the day-room of the monks. It would be observed that the lights on the west side of the buildings had been entirely blocked by the erection against that side of a new refectory. It was an interesting foundation, said to have been established by William de Romará, in 1188. That was a critical period in Cistercian history, for it was not until 1191 that the consuetudino was sanctioned

* See p. 892, *ante*.

by the general chapter of Citeaux. He particularly called the attention of visitors to the large quantity of heraldic tiles found on the church and about the abbey. They fixed the time when the refectory was built as in the reign of Henry III. There could be no doubt that there had been two sets of alterations, and there was a mixture of really good and very bad work. The windows of the refectory were beautiful, because they had a transom, with ogees, and also quatrefoils in the parts that were cut off by the ogees against the square of the transoms. The tracery of the window at the end of the refectory was beautifully done, but it had been spoiled by the wood-work which had been inserted in later years. They saw the lavatory underneath the refectory windows in the cloister garth. There was this departure from the simplicity of the normal arrangement,—they had lifted the refectory, and, in fact, gone upstairs to dinner. Near the fireplace here were the remains of a staircase, which evidently led to a small pulpit for the monk who read at meals. At Fountains Abbey that arrangement was very perfectly marked, and the small cupboard where the books were kept might still be seen. They ought as archæologists to feel glad that this valuable relic had fallen into the hands of so careful a man as Mr. Luttrell, who had not only gone to the great expense of getting the ruins into their present state, but had himself taken great interest in seeing this grand old book, which had been covered with dust, opened, so as to leave a few lines in which they could read a little of its history. There was no such sermon in stones as that to be found in the ruins of a Cistercian abbey.

The excursionists next proceeded to Dunster Castle, the residence of Mr. G. F. Luttrell, by whom they were hospitably entertained in the Gatehouse, and afterwards shown over the Castle, upon which Mr. G. T. Clark gave a short address. He said the great feature of ancient castles were the mounds, and these mounds were either artificial or natural. At the foot of the mound, unless there were other defences, there was a ditch. On one side, outside that ditch, was a court, which also had its ditch. Here they had the mound, and the buildings of the castle stood upon the enclosure of which he was speaking. These mounds were exceedingly common. They were not like the earlier British or Roman works, which were intended for the accommodation of a large garrison. They were thrown up simply to hold the residence of a man of rank who lived there. The mound was thrown up really out of the ditch, and the owner placed himself at the top. They were not always natural, however. Sometimes nature provided the mound, and the house was built upon the natural rock. They had such a one at Pomfret, and this one was an instance. Then came the question what were upon the earthworks. They were not left to conjecture in this matter. In the first place, it would be quite impossible for many years to erect anything like a substantial building of masonry. Therefore, it was necessary to find some material which could be thrown up on hard ground. The material used was timber, and that suited very well the habits of the Northern nations, who were a maritime people, and accustomed to handle timber. There was a representation of such a structure on the Bayeux tapestry: a castle was placed on the top of a mound, and a body of men were assailing it, and endeavouring to set it on fire. Sometimes the defences of these were both natural and artificial, and there were instances in some places that, not content with the defences of the castle, they threw up a mound as well. The first mention they had of Dunster was in Domesday. Dunster was there mentioned as Torr, which was a west-country word for hill, and they were told that Aleuric possessed the Torr in the time of the Confessor. It was then possessed by a Willliam de Mohun, who "figured" at Hastings, and received from William the Conqueror a grant of something like sixty or seventy manors. He held a strong and comfortable position here, and was able to interfere very materially with his neighbours. It was the strong fortress of the west, and there must have been the means, therefore, of holding it well. But the strange thing was this, and it was not peculiar to Dunster. They might suppose that he built a shell keep here. The question was what he did build. If there was an *enceinte* of Norman masonry, where was it? There was no masonry visible earlier than the time of Henry III. There was nothing approaching Norman work in the castle, although there was in the church. Norman masonry was, for the most part, excellent masonry, and very thick, and a castle that was built in the time of the Conqueror or William Rufus was not likely, in the time of Henry III. to be rotten. There was evidence of a keep, for not long ago Mr. Luttrell, in digging here, discovered some indications of a large sewer, which might be taken as conclusive evidence that there was a keep and castle. Nothing of that sort had been discovered below the time of King John and Henry III.; both held this castle in wardship during the minority of the owners, and Henry III. mentioned it as "my castle." That was curious, because Dunster was never considered a royal castle. In those days there might have been a keep here. Then there must have been a boundary wall which went in the shape of a half-moon, which had flanking towers upon it. The upper ward of the castle would not be accessible to carriages and horses, and the access to the keep was different from the present roadway around the mount.

A short visit was next paid to Dunster Church, under the guidance of Dr. E. A. Freeman, who called the attention of the party to a staircase tower near the middle of the south wall, indicating where the rood-loft inside existed. That explained the whole history of the building. The changes that had been made had to some extent destroyed the original arrangement; but it was something to be able to say that a restoration had left anything at all. Inside the church Dr. Freeman explained the real nature of the building. The matter was of some importance just now, because of the case of the collegiate church of Arundel, which was recently decided by Lord Coleridge. The judge had decided, on convincing evidence, that there were two churches,—the eastern part was not the chancel of the parish church, but was the collegiate church, which by the suppression became the private property of the Earl of Arundel, now Duke of Norfolk; and exactly in the same way, while the parish of Dunster owned the western side of the church, the eastern side was as much the private property of Mr. Luttrell as his castle was, and he had as much power to pull it down as to pull down any part of his private house. The suppression of the monasteries did not affect the rights of the parishioners, but it did affect the monastic churches, for they, with the rest of the monastic property, passed into the hands of the person the king granted it to. This church and Ewenny, in Glamorganshire, were the two cases which now taught them really what this dual arrangement was. Inside the church Dr. Freeman repeated his explanation, pointing out where the choir of the parish church commenced and where the division took place. The division was made in 1499, and he had a copy of the document referring to it in his hand. The Prior of Bath and the Abbot of Glastonbury were made arbiters between the priory and the parish of Dunster, and they decided that the church should be divided, and that the parishioners should occupy the western part of the church, and they made a new choir there, and the priory the eastern side.

Lord Talbot de Malahide said that a similar arrangement was common in Spanish churches, and there was a division of the kind in Westminster Abbey.

Dr. Freeman said if Lord Talbot de Malahide had spoken of Germany he would have mentioned an analogous case. The division in Westminster Abbey simply arose from the fact that the choir was in the constructed nave. There was no double choir, as here. It was a single choir, which happened to be west of the central tower.

The party returned to Taunton by train. A *conversazione* was held in the evening, and an interesting paper, entitled "A Valhalla of Somersetshire Worthies," was read by Mr. Arthur Kinglake.

On Thursday, the 7th, the proceedings commenced with the opening address of the President of the Historical Section, Dr. Freeman, who said that in passing from Northampton* to Somerset the Institute passed from one of the regions of England most favoured in antiquarian wealth to another region no less favoured. The comparison and contrast between the two with regard to buildings is attractive, almost fascinating. Northamptonshire is, among all the shires of England, one of the richest, perhaps the very richest, in buildings of Romanesque date and style. It abounds in every variety of round-arched architecture, from those arches of the basilica of Brixworth, which, whatever may be their date, are surely Roman in material, Roman in style, to those arches of the Minster of Peterborough, whose mouldings show that nothing but conformity to each other's design kept their builders back from adopting the constructive forms of the then new-born Gothic. In the average Northamptonshire parish church we look at least for a Norman doorway, while in not a few we find other features of that style reaching their climax in the rich capitals and arches of St. Peter's in Northampton. And Northamptonshire has more precious relics still. Fragments of earlier days,—arches, doorways, whole towers, built in that primitive style which our earliest teachers brought from Rome,—are there usual enough to cease to be wonderful. Here in Somerset one may go miles without seeing a wall of even Norman work, and I doubt whether a mid-wall shaft is to be found between the Avon and Exmoor.

In the same section papers were read by Mr. C. N. Welman on "The Battle of Sedgemoor"; by Mr. E. Green on "The Siege and Surrender of Dunster Castle"; and by Mr. Chisholm-Batten on "Henry VII. in Somerset."

In the Architectural Section, the Rev. Sydenham Hervey read a paper on "The Supposed Palace of Alfred the Great at Wedmore."

The annual meeting of members was afterwards held, and it was decided to meet next year in Lincoln.

In the afternoon there were excursions to Castle Neroche and Staple Fitzpaine, and at a sectional meeting held in the evening the Rev. Prebendary Scarth read a paper on "The Roman Occupation of the West of England, particularly in the county of Somerset."

On Friday, the 8th, there was an excursion to Bridgwater, Cannington, Blackmoor Manor House, Stogursey Church and Castle, Fairfield, Dodington Manor House, and St. Audries; and on the return of the party to Taunton in the evening a *conversazione* was given by the mayor.

On Saturday, the 9th, there was an excursion to Muchelney Abbey, Martock, Montacute House, Stoke, South Petherton, and Barrington Court.

On Monday last the members went on an excursion to the cathedral city of Wells, under the guidance of Mr. J. H. Parker and Mr. M. H. Bloxam. A visit was paid to Glastonbury on the return journey.

We will next week conclude our notes of this congress.

* The *locals* of last year's meeting of the Institute.

CRYSTAL PALACE SCHOOL OF ENGINEERING.

On Saturday last the twentieth term of this school was brought to a close in the school lecture-room in the south tower of the Palace. There were sixty-five students in attendance during the term, including twelve in the Colonial section. The certificates awarded to the successful students were presented by Captain Douglas Galton, F.R.S.

There was a large attendance of the friends of the pupils and of the school. The work of the students in the drawing-office, in the pattern and fitting shops, in the two courses of civil engineering, and especially in the Colonial section, was examined with unusual interest. The camp of the Colonial students had many visitors. It is pitched on the tertiary island at the southern portion of the Palace grounds. The work of the students shown there included two well-made bridges, a pontoon or barrel bridge, and a double lock-bridge, each made according to drawings and specifications. Their work on the island included also the fixing of their sleeping and mess tents, and of their erection and working of their rude, yet thoroughly effective, camp-fires, for hot water, stew, and vegetables, with an oven for baking and the open fire for broiling. The materials used were stones, clay, a few iron bars, and a short length of iron funnel for the chimney, which, on some former occasions, the students have built of clay. The cooking apparatus was shown at work under the skilful superintendence of student W. Thackwell, who, in the absence of Mr. Rixon, was left in charge of the camp, and privileged to show hospitality to the friends of the students by a taste of the savoury viands cooked in the primitive *al fresco* kitchen. The work of the Colonial students included also patterns for a lattice girder-bridge, a plunger-pump, railway platform, four-panelled

doors, with mitred mouldings, carriage and wagon wheels, hammocks, chairs, tables, wheelbarrows, an overshot waterwheel, with double buckets, and a quantity of carpentry work that would do no discredit to ordinary trained handicraftsmen.

The lecture examination was on "Railways, their Construction and Appliances." The highest number of marks attainable is 250. The examiners put A. M. Tippett first with 205 marks; he was first also for work in the fitting-shop. G. M. Lawford was second for lecture examination, and had also a certificate for fitting; W. W. Buckland third for lecture questions, and a certificate for fitting. Thirty students attended the lectures, twenty-one were eligible for examination, and fifteen received certificates. In the drawing-office, five certificates were awarded, H. G. M. Conybeare, first; G. Okubo, second; and A. J. Jack, third. Twelve certificates were awarded for pattern-making, A. J. Bovill first; A. G. Drury, second; and G. Bird and W. Maylor, equal thirds. Nine certificates were awarded for fitting, E. Moul, A. M. Tippett, and M. Wilson, equal firsts. In the Civil Engineering section for preparation of plans for Parliament, the order of merit was, J. M. Templer first; G. N. Taylor, second; and H. Gordon Cumming, third. For calculation of strains, plans, specifications, and estimates, for railway and dock work, A. A. Barnes, first; E. Allen, second; and D. C. C. Grey, third. Certificates of merit were also awarded to a number of students in the Colonial section, including A. R. McEwen, F. Clifford, R.E.; M. Labarca, W. Thackwell, &c.

Captain Galton delivered an address to the students and visitors. He said he felt sure that those who had inspected the work of the students would think it almost impossible to overrate the value of the technical education, the practical instruction, and the careful training given in this school; he heartily desired that all the young engineers in England could be put in possession of equal advantages. His young friends should take a high view of the responsibility, the dignity, and usefulness of their profession. To the engineer the world had to look not only for providing means of transport by land and water, but also for the promotion and provision, directly or indirectly, of the conveniences and needs of daily life. The engineer was the pioneer of modern civilisation. He converted the rushing cataract into a peaceful mill-stream, or into a canal to facilitate intercourse between adjacent towns; he even bent the wind to the service of man, and made it drive mills and waft ships across the ocean. He had recovered large tracts of land from the sea, in Holland and other countries, and even in our own. He had deepened shallow streams, and made them navigable channels; had immensely improved agricultural conditions, and had had much to do with our being able to obtain food from almost everywhere,—fruit and vegetables from the other side of the world cheaper than we could produce them here.

Thanks were voted to the examiners, Messrs. W. Shelford and J. L. Haddan, and with some other complimentary expressions the proceedings were closed.

"AN INCREDIBLE STORY."

UNDER this title Mr. T. J. Nelson has addressed a letter to the Earl of Beaconsfield (Jas. Truscott & Son, Suffolk-lane, City), setting forth the condition in which certain places on the Thames, such as Richmond, Kingston, and Barnes, find themselves with reference to the disposal of their sewage. Towards the close Mr. Nelson thus sums up, and asks the Prime Minister to help them out of the difficulty:—"We find the Lower Thames Valley in this incredible position. The local authorities are required by law, and under severe penalties, to divert the sewage of their respective districts from the Thames. One district after another has, as I have detailed to your lordship, produced schemes for obeying the law which have been impartially stifled by the Local Government Board when their authority for carrying them out was asked for. It mattered absolutely nothing what the unfortunate district proposed,—whether irrigation, downward filtration, precipitation, or chemical treatment, nor whether the place of treatment was in the district or out of the district,—opponents always appeared, and they always succeeded in preventing the local authority carrying out its plans.

At last came the formation of the Joint Board. They took up the onerous and ungrateful burden of carrying out the orders of the Legislature. Nor did they walk in the dark; the Local Government Board had issued for the guidance of all sanitary authorities the report of a commission of most able men, who, after an exhaustive examination of the various plans in operation, both in England and on the Continent, united in renewing the recommendation of former royal commissions that irrigation on land was the best and safest mode of dealing with sewage.

My Lord, the Joint Board acted on this authoritative advice; their engineer was an able and competent adviser,—Colonel Haywood, the engineer of the City of London. He was assisted by another engineer well known in sanitary matters, Mr. Peregrine Birch. One of Colonel Haywood's competitors, Mr. Mansergh, C.E., to his great honour, made an independent examination into Mr. Haywood's scheme, after the rejection of his own, and gave it his cordial support. Other eminent engineers, agriculturists, and sanitarians,—Sir John Coode, C.E.; Professor Frankland; Dr. Tidy; Colonel Jones, V.C., C.E.; Edwin Chadwick, C.B.; Baldwin Latham, C.E.; Hawksley, C.E.; Grantham, C.E.; Chalmers Morton; G. J. Symons; and Buchanan, C.E.,—expressed opinions favourable to the scheme, and were prepared to testify in its support; as did also Mr. Ripley, C.E., the assistant of the late Mr. Menzies in successfully dealing with the sewage of Windsor Castle and of Eton.

With all this care, precaution, and advice the Joint Board failed in accomplishing the one purpose only for which they exist, and at Michaelmas, 1880, the suspended penalties will become due, and something like one million of money will be enforcible against the unfortunate ratepayers. Such gentlemen in this neighbourhood as are foolish enough to remain members of the Joint Board may then be served with a mandamus from the Queen's Bench Division of the High Court of Justice, not only to make the rates to pay this million of penalties, but also with a peremptory order to execute an impossible work under the penalty of being punished for disobedience by imprisonment in Holloway Gaol."

ASPHALTE, AND ITS APPLICATION TO STREET PAVING.*

Durability of Compressed Roadways. — M. Chabrier states that the effect produced by wear and tear on asphalte is so trivial that it may almost be said to be imperishable so long as no other cause than friction of wheels occurs to alter its working conditions. It is hardly possible to accept such a statement without challenge, and the wear is unquestionably so slight that exaggeration is not necessary, even by partisans. The most lengthened experience in England is in the piece of road laid by the Val de Travers Company in Threadneedle-street in May, 1869. In February, 1877, the City Engineer reported this piece of paving as having had few repairs, and being in good condition. The author examined it a few weeks ago, and, with the exception of those places cut out for experiments and gas or water repairs, the surface was in good condition; it has been subjected to a traffic of 200,000 tons† per annum per yard of width. Unfortunately for the statement just quoted by M. Chabrier, the pavements of all cities are subject to many other incidents tending to destroy them than mere friction of wheels. The constant removal of the surface to repair gas and water mains and drainage is such that in many streets 50 per cent. of the whole surface will be removed during the life of a pavement.

Rock asphalte is compressed without appreciable wear under traffic such as the above. On the table is a specimen taken from Cheapside. It was laid in December, 1870, 2½ in. in thickness. After having been subject to a traffic of upwards of 500,000 tons per annum per yard of width, the bulk is reduced $\frac{1}{10}$, while it has lost $\frac{1}{8}$ in weight. The difference in the percentage of loss of bulk and weight is accounted for by the compression of the material. This is apparent to the depth of half an inch. Under a magnifying glass the compression can be seen to a depth of more than 1 in. After fifteen years' wear in the Rue Bergère, the loss by weight was 5 per cent. In Gracechurch-street, where the traffic is 603,000 tons per annum per yard of width, the material has lost in bulk and in weight during a period of eight years. These results are all obtained from the compressed rock of the Val de Travers. When other materials in mastic have been laid in streets of much less traffic, they have been replaced either with compressed or wood; and, without making invidious distinctions, it may be here stated that experience in London has demonstrated the fact that no class of asphalte has stood equally well with that of the Val de Travers compressed. From 1870 to 1878 thirteen different kinds of asphalte had been tried in the City of London. At the period of writing but three remain in streets having traffic of more than 500 vehicles in twelve hours. The manner in which the compressed rock is laid has much to do with its duration; disintegration has taken place in many roads from circumstances that are not readily accounted for; fissures appear on the surface, so close together as to form a complete web-like appearance; the percussion of the horses' feet detach small portions of the material, and if frost supervene, the road will quickly fail, owing to the crystallisation of the water held between the fissures. It has been urged that this is occasioned by the execution of the work during wet weather. When the heated powder is placed on a wet surface, vapour of water is produced; this permeates the powder below the bulk influenced by compression, and it will be readily understood these prevent the perfect homogeneity of the whole. Another cause of failure is owing to the cracks being produced by the use of too new a cement for a foundation. When the concrete fails the asphalte will fail also. The question of durability, apart from other considerations of convenience, is the question of cost. It is, therefore, necessary to compare this with other materials.

The cost is reduced to 100,000 tons per annum per yard of width.

Description.	Original Cost per Square Yard.	Interest on Original Cost.	Sinking Fund at 3 per cent. Compound Interest.	Maintenance per Square Yard.	Scavenging per Square Yard.	Total.
	s. d.	*d.*	*d.*	*s. d.*	*d.*	*s. d.*
Wood (Liverpool)	15 1·5	7·5	10·1	0 1	2·7 Gravel. 5·0	2 2·3
Val de Travers compressed asphalte	18 0	9·7	...	0 3 6	0·4	1 1·7
Granite	17 9	9·6	9·5	0 1·3	2·5	1 1·9
Macadam	4 9	2·1	...	3 6	12·0	4 8·1

It will be observed that nothing is charged for renewal of asphalte, inasmuch as the annual sum for maintenance provides the asphalte in perpetuity. In Paris $\frac{1}{5}$ of the entire roads paved with asphalte are renewed every year at a charge of 8d. per square yard; but there are no precise figures whereby to reduce the cost to the above standard, as this sum includes many roads having very small traffics. In London the Val de Travers Company maintain various streets at fixed sums per annum, from which the figures in the table are arrived at. The figures for wood are those of Mr. Deacon, which the author believes are the only figures reduced to the standard that can be relied upon; all the observations of engineers in New York, Paris, and London, confirm these, although not reduced to the same data.*

From Colonel Haywood's reports it would appear that the average duration of wood pave-

* From a paper by Mr. E. B. Ellice-Clark, Associate Inst. C.E., read at the annual meeting of the Association of Municipal Engineers and Surveyors, August 1st, 1879.

† These weights are approximate, and probably considerably under the actual weights. Each vehicle is taken to weigh a ton and a half, probably 50 per cent. might be added to them; but, as there are no means of ascertaining the weights exactly, Colonel Heywood has never given weights in his reports, so that in comparing these figures with those given by other writers, the vehicles must be reduced to the standard of 1½ ton weight each, and the traffic is for twelve hours only each day.

* See Appendix, p. v., to Report of the Paddington Vestry, 1878; Report of Colonel Haywood on Wood and Asphalte Pavements, 1877; Report of Mr. Van Nort, of New York, December 17, 1874.

ments in the City is three years. The following will show the life of some recently laid:—

	Years.		Years.
Gracechurch-street ...	1¼	Aldersgate-street ...	3
Great Tower-street ...	3½	Angel-street	3
King William-street..	2½	Ludgate-hill	3½

With regard to the absence of foothold for horses, the observations made in London prove that asphalte is not so slippery as granite cubes. It is now well known that when the atmosphere is humid the fine dust and dirt, ever present in a city street, are spread over the surface of the asphalte by the traffic, forming a pellicle, which renders foothold difficult. In dry weather the road is also covered with the *detritus* incidental to great traffic, apart from wear. When asphalte is swept as a method of cleansing, this adheres to the surface, and becomes greasy mud with a very slight shower of rain. In Paris grit is thrown down on such occasions; but the proper method of cleansing asphalte is by hydraulic and not mechanical means. With fire hydrants on each side of the roadway this could be effected at slight cost. Hitherto this has not been done in London, as there were no hydrants, but in cities where hydrants are in use the difficulty would be solved. Asphalte, either wet or dry, affords an excellent foothold. Trials of asphalte, on a small scale, are not to be relied upon. No trial can give a fair result unless a considerable area is paved. It was abandoned in Manchester, where only 968 yards super. were laid; but has remained in Southampton, where 1,587 yards were laid in 1873. In no case should a length of less than 440 yards be laid. Horses do not become used to the surface in short lengths, and unless the adjoining road is paved and kept clean asphalte will be not only dangerous but costly. The maximum foothold for horses will not be attained until every street in a town is paved with the same material.

Maintenance.—Hitherto in England the maintenance of asphalte paving has formed part of the original contract of construction. Engineers appear to have thrown the responsibility of repairs upon the contractors, because want of experience did not justify them in taking over the roads when once completed, and waiting results. So far as the author can ascertain, only one engineer, Mr. Lemon, reported against a fixed annual sum for maintenance. In London the prices vary from 3d. to 1s. 6d. per yard per annum. These prices are based upon the cost of granite maintenance, and in many cases are probably too much, while in others they are too small. The periods for which the maintenance is contracted vary from ten to seventeen years, at the end of which time the pavement is to be as good as when first laid. Whether this is an economical method of maintenance cannot yet be determined. In Paris, where the original contracts have long expired, the work is let for seven years, and the contractors have to renew $\frac{1}{7}$ of the entire areas each year; the life of the pavement is thus fixed at fifteen years. As the application of asphalte is increased, this method will probably be found more economical than that previously alluded to, and experience will prove what areas will require renewal. To state broadly that $\frac{1}{7}$ of the asphalte must be renewed, appears a random method of determining the needful repairs. Each street should be treated on its merits; thus Cheapside would require much more frequent renewal than George-yard, and the two should be kept separate. Maintenance of road by contract has dropped into disuse in this country; but will have to be resorted to for asphalte works.

It is, therefore, necessary to determine when a street requires renewal. The surfaces must be replaced when there are cracks $\frac{1}{16}$ in. in width, or there are holes $\frac{1}{2}$ in. deep; or when there are depressions in a circle of 3 ft. 3 in. in diameter, the normal depth of the hollows being at least 1¼ in.; or when the water in the channels cannot be freely discharged, and when the joints or partings from the curbs or other paving stones are $\frac{1}{2}$ in. wide; and when the surface is blown up or lifted $\frac{1}{16}$ in. above the adjoining surface. These defects, if not repaired, will subject the contractor to a fine, according to a scale of areas and depths. With regard to the repairs to trenches, they must be paid for as new work. In the city of London, immediately the excavation is filled, the concrete is laid, and in a few hours the powder is compressed. Within the past month portions of the roadway have been opened and closed within twenty-four hours; this may be insisted on in streets of great traffic; but, for reasons previously stated, the asphalte can never obtain that firmness over such trenches as it does when the concrete is dry. In Paris a maximum period of fifteen days is allowed; while the trench is becoming consolidated, the surface is kept up with flints. Probably the most convenient mode of maintaining the asphalte would be by schedule of prices; the engineer giving directions which portions are to be relaid. The only difficulty would be this:—When the contract expires under the previously described mode, the entire surfaces are to be in good condition; this compels the contractors to execute good work, and as the methods of preparing asphalte and the different qualities are so variable,—gives such opportunities of fraud,—the engineer will have to be thoroughly conversant with the details, and exercise a rigid supervision over every process, as well as to sample frequently the natural materials. For these purposes the French engineers have prepared elaborate specifications, to which reference can be made.*

Convenience—Sanitary.—One of the greatest inconveniences in a city of great traffic is the renewal of a road,—this work frequently closes a street for a fortnight. With granite in Cheapside this occurred about once in nine years. With wood-paving the nuisance and loss has been intensified to a degree that cannot be tolerated. With the compressed Rock of the Val de Travers a street never need be closed for a day when once the work is completed. Cheapside has been down nine years without the traffic being stopped an hour for road renewal. The advantages of paving streets with a smooth, impervious surface are so great that no one can contest the point as to cleanliness. The results from actual observation give:—

Material.	Superficial Yards for each Load of Mud.	Traffic in Tons per annum per Yard of width.
Macadam	344	25,000
Granite	500	50,000
Wood	1,666	25,000
Asphalte	4,000†	500,000

As dirt means mud in wet weather, and dust in dry weather, the same proportions hold good when considering the question of dust. The asphalted streets in London are never watered; streams of water are sent down the channels where dust collects.

Absorption of Filth.—No positive statements, founded on facts, have ever been placed on record as to the actual amount of filth absorbed by different classes of pavement. The only fact recorded is patent to the eye, and is disputed by none, that whether other materials do or do not absorb filth and moisture, asphalte does not. Opinions, only founded simply on general observation, and to be taken for what they are worth, place the materials in this position as to absorption:—

Macadam—1.	Wood—3.
Granite—2.	Asphalte—4.

Freedom from Noise.—This desideratum has led, no doubt, to the application of new materials for roads in large towns. As there are no means of measuring noise, opinions must be relied upon. When wood is new, close-laid, and the pavement is perfectly level, it may be characterised as noiseless. In consequence of the density of the asphalte, the horses' hoofs can always be heard upon it; and as the surface wears away in undulations, and as these are not defined by such sudden vertical depressions as all pavements composed of blocks show when wearing away, the comparative quietude of wood and asphalte depends entirely upon the state of repair. Seeing that none of the wood pavements in London have lasted many years without being relaid in streets of great traffic; see reports of their existing condition,‡ it appears to the author that they cannot be maintained with that evenness of surface which places them at the head of the list for noiselessness; and that on the average state of the two materials asphalte is equal, if not superior, in this respect to any other kind of material, both it and wood being preferable to macadam, as that is to granite. The only point now remaining is the gradients at which the material can be laid with safety. It would be unwise to lay asphalte on any gradient much steeper than 1 in 50, although a portion of Broad-street, London, is 1 in 46, and no inconvenience has been felt.

* "Roads and Bridges, Municipal Service of Paris." Schedule and specification for footpaths and pavements in bitumen and compressed asphalte issued by the Prefect of the Seine. † Approximate.
‡ Colonel Haywood, Report, 1877.

THE ARCHITECTURAL ASSOCIATION AT WELLS.

When Bishop Beckington, about the middle of the fifteenth century, contemplated the erection of the houses which still line the north side of the market-place in Wells, he had either been struck by the effect seen in many Continental towns,—a mass of cathedral on rising ground above a comparatively low screen of houses,—or, by accident, he was advised to undertake something which leads to the somewhat similar result of to-day. The central and western towers show much of their bulk above the old houses,—modernised almost out of recognition, it is true,—and over the "Penniless porch" at the north-west angle of the *place*, and over the buildings between it and perhaps the most imposing of the four gateways to the precinct. The flaming beacon threaded through a barrel, the *rebus* of Beckington, shows on this gateway as well as on "The Bishop's Eye." It might properly have appeared, also, if the founder had so willed it, on the well-house in the garden of the bishop's palace, on the north side of the moat,—a pretty little stone building square in plan, with a stone roof and mullioned windows. That well-house was part of a work which furnishes to Wells another feature shared with many Continental towns, built on the sides of more or less gentle hills, but which has not often struck the imagination of would-be benefactors of similarly situated English towns. The well-house is within a stone's throw of the heads of the springs, which have welled up for so many centuries on the same spot, which gave the name to the place,—and furnish still one of its notable characteristics, and call attention to others. These springs are the outlets from a water-bearing stratum on the east side of the city,—a stratum fed from an area so large and inclined from the horizontal so steadily that,—even in the dryest seasons,—although the supply may not be driven upwards in so great quantity, the water has never been known to fail. To the well-house the water is led from the springs, and from it pipes lead to the conduit in the Market-place,—which,—till a few years ago,—supplied the inhabitants generally with water. From the conduit and other waters at the upper level strong rapid currents of clear water are constantly running in the stone channels on each side of the High-street,—currents which seem to know no change, but fill with their pleasant sound the dreary hours of the quiet day in this sleepy hollow of Somerset. Currents run further down into Broad-street, which has the same gentle incline downwards to the west, and then onwards to join the river Brue, and to feed,—along with the drainage of the marsh land nearly twenty miles long,—the Bridgewater Bay, where it broadens the Bristol Channel, and makes it fully fifteen miles wide,—just before it begins its northern turn, and thus gets ready to become the river Severn between Cleveland and Cardiff.

These characteristics of the bishop's town of Wells have not always appealed so strongly to the imagination of those who have written descriptions of it as the calm beauty of the close. "There is a profound peace about these precincts," says the regretted Mr. R. J. King, whose measured utterances on such subjects we shall miss much as the years go by; "the feeble sounds of the little town hushed and softened by distance, and all around breathing a holy calm." The fact that there is a town as well as a close underlies this memory of street scenes, and might lead any one given to such unconscientious movements to the perverseness of wishing that the town could be wholly worthy of the church under the shadow of which it grew up. The church and its precincts were not taken into the city till the days of reform in Parliament and municipal affairs,—comparatively recent to us in fancy,—even though nearly half a century has gone by since such things began to be seriously considered. The buildings for laymen were erected hard by the cathedral of the bishopric of Wells, the diocese which comprised the county of Somerset, and were added from time to time after Edward the Elder detached this county from the diocese of Sherborne, in the beginning of the tenth century. Durham and Salisbury are the nearest examples of towns which grew up around cathedral foundations; but there are strong differences between these bishops' towns and Wells. It, alone among the cities of England proper, claims no other position than that of a cathedral city, whose history is the history of

its cathedral church; with only such slight exception, for instance, as the occupation of the city by the forces of Monmouth on their retreat in 1615, when the church ran danger from their desperation. Perhaps the city might be the better if the claims of its history were not put with such absolute fierceness. The opening in the line of houses at the west of the green space at the west of the cathedral, which has made the Swan Hotel a much pleasanter resting-place for the members of the Architectural Association this week, need not be denounced as an act of very hopeless Vandalism. A bit of a mere boundary wall has disappeared, and an iron railing with a gate in it has taken its place; but what resident or stranger need forget, unless he wishes to do so, that the straitened accommodation between street and close of the early centuries is well enough marked to the north and south of the opening, and that modern ideas do not allow much enthusiasm for congested house sites in the midst of abounding plenty of agricultural land?

When such concessions as are extorted by the force of facts have been made, and all acknowledgments, as in duty must be, of the interesting surroundings,—the range of the Mendips, the southern hills, the rounded hills on the west, —Dulcot Hill and the Ebber Rocks; when it has been mentioned that the basin in which the city is placed is surrounded with natural beauty, it is then about time to turn to the special interests which bring archæologists in troops to sojourn here for a time, and realise the olden days with a vividness only possible, where such helps to the fancy are before the outward and inward eye,—

> "Where the great tide of human life stands still;
> The blended calmness of the heaven and earth,
> Moonlight and stars, and empty streets, and sound
> Unfrequent as in deserts,"

are no unwholesome surroundings for him who makes strenuous holiday.

The purely architectural considerations, which occupied the Association during the morning of Monday, were brought forward by Mr. E. B. Ferrey, who accompanied the body, by that time consisting of near upon forty members, over every part of the cathedral church. We do not propose to follow the history in detail. Many readers must know it by heart. For others, it will be sufficient to call to mind that the earlier structures have entirely disappeared; and that the present building has nave and aisles, transepts and transept aisles, and part of its choir of Early English date; undercroft to chapter-house (the only example in England), and the chapter-house itself of Early Decorated; Decorated central tower, choir, and lady-chapel; Perpendicular west towers (the upper parts), and Perpendicular cloisters. The west front, some of the earliest work in the church, has had its share of notice of late years. It has been praised without measure. Flaxman's eulogies of its admirable figure sculpture have been quoted without stint. It has been denounced as a sham front; dishonest;—not the natural finish of the nave and aisles;—the architectural feature put into the second place; sculpture and ornament,—properly secondary considerations, —having assumed the first. It has been the subject of special notice on account of its being subjected to restoration. Several feet of earth heaped over its plinths have been cleared away, to nobody's regret to-day, though the prognostications of evil were not infrequent before and during the performance of that simple task. The decayed Dettingstone,—stone of the inferior oolite, from a quarry about nine miles from Wells, used in the buildings generally,—has been replaced with new Doulting stone, and the harsh contrast was wept over, and artificial toning talked about. Nature has dealt kindly with this defect, and the new stone is rapidly sinking into its place among the old. Most of the lias shafts, standing in a hollow moulding at their bases, had rotted at their feet, and the sun had twisted some of them as sticks of sealing-wax may be twisted. Kilkenny marble has replaced the lias, and gives good hope of duration. Indeed, the hardness of the surface seems now its drawback. Whereas, the lias shafts which remain are beautifully toned to harmony with loss of distinction of colour, the Kilkenny shafts resemble new slate pencils more closely than zinc rain-water pipes. If the blanched dead surface of these shafts give no sign of weather in years to come, after due patient waiting, it may be seriously debated whether surfaces may not be artificially roughened, and hold given to clinging lichen and other growths. The architectural carving has been largely renewed, the finials of the lower arcade, for example, from old finials recovered very strangely by cutting away the masonry which had been built up on the south face of the south-west tower. The figure sculpture, albeit much decayed, and in some parts completely missing, has not been dealt with. Careful and conservative restoration could no further go. The gilded vanes, added to the pinnacles on the faces of the towers, might be called spotty, and the life which they are deemed to give to the building be exchanged, not wholly with regret, for more perfect repose; but the evidence for their previous existence can hardly be questioned. The louvres in the lower windows, which fit their windows so well in scale, may suggest that further reforms in the towers might be equally successful, and that all changes are not necessarily injurious. Why should the two western towers retain the look of mutilation, as if the pinnacles, obviously designed for the angles, and between the angles, had been sawn off to a line? It is true that what would be the beds of the pinnacles are weathered all ways ingeniously to turn the water out between the embattlings of the cornice; but was this more than a temporary device, resorted to till pinnacles such as those which suit well the centre tower could be erected? The question of spires for the towers opens too large a question to notice here, but one which it is profitable to discuss from time to time to get good grasp of principles, both of architectural design and of the proper treatment of old buildings. Spires of wood covered with lead have their eager advocates. It may be mentioned anent a little detail given by Murray with undue certainty in the midst of a good account of the church, that Mr. E. Ferrey considers that in the uppermost stage of the central part of the front, the figure of the Saviour in majesty had on each side of it an angel censing; it was not supported on either side by the Virgin and St. John." He also considers that a large floriated cross occupied the centre of the uppermost coping in the original design, in the place where the large pinnacle of Decorated date now stands. The peculiar crockets in the lower tiers, especially those on the east face of the north-west tower, deserve a word on account of their general likeness to those at Lincoln and in the west porch at St. Alban's. They stand straight up with circular tops and very flat treatment of the sides.

This may suffice in the way of notice of a long peripatetic lecture,—lasting, in fact, several hours, and delivered in very varied situations inside and outside the church and its appurtenances. It should be mentioned that Monday was the last day of the Taunton meeting of the Royal Archæological Institute, and that Wells occupied them in the morning and Glastonbury in the afternoon. In the chapter-house were hung the plans to illustrate his theory of the chronology of the church prepared by Mr. J. F. Irvine, the clerk of the works at the cathedral during the restoration,—who would, among other revisions of previous beliefs, put the west front at the beginning of all if his argument were accepted. Some of the capital drawings by Mr. Clark, of Wells, who has rendered good service to the Association, were also exhibted; they show buildings now destroyed which stood about the cathedral in not distant years; and old states of buildings which have been or will be altered within memory. The history of the cathedral was described to the Institute by Mr. E. A. Freeman; the architecture by Mr. J. H. Parker.

The Bishop (Lord Arthur Hervey) entertained the Association and Institute at the palace in a genial way, and expressed the pleasure it had given him to do so when his health and that of his lady were proposed by Lord Talbot de Malahide, and drunk with hearty cheering. The palace, from roof to cellars,—including the family rooms,—was shown to the members of the Association,—a rare if not unique house. The members had lunched in the hall founded in the thirteenth century; they inspected the chapel,—a very perfect work in Geometrical Decorated,—and the ruins of the great hall, also built by Bishop Burnell. The sixteenth-century works of Bishop Clerk, and the Jacobean screen, &c., in the servants' hall, the adaptations to modern requirements, the enriched ceilings of forty years since, and of course many other details, go to make up a really wonderful result. Inside the very walls erected in the first half of the thirteenth century, and with an outlook through the windows of Bishop Jocelin, the best life of the nineteenth century is being lived. The excursion will take the members to almost all the buildings of interest within easy drive of Wells; and something may have to be said of the later doings at Wells itself, as well as elsewhere. No fresh words will, however, need to be added to, or new words to be substituted in, the well-known summary by Mr. Freeman of the claims of Wells to our regard and attention, which all visitors will do well to make their own at the beginning and the end of their study of "one of the most beautiful things in the world."

"The traveller who comes down the hill from Shepton Mallet looks down, as he draws near the city, on a group of buildings which, as far as I know, has no rival, either in our own island or beyond the sea. To most of these objects, taken singly, it would be easy to find rivals which would equal or surpass them. The church itself, seen even from that most favourable point of view, cannot, from mere lack of bulk, hold its ground against the soaring apse of Amiens, or against the windows ranging, tier above tier, in the mighty gable of Ely. The cloister cannot measure itself with Gloucester or Salisbury; the chapter-house lacks the soaring roofs of York and Lincoln; the palace itself finds its rival in the ruined pile of St. David's. The peculiar charm and glory of Wells lies in the union and harmonious grouping of all. . . . The aspect of the place tells at once that we are looking on an English cathedral church, on a cathedral church served by secular canons, on a church of secular canons, where ancient buildings and ancient arrangements are preserved more perfectly than in any other in the island."

THE LONDON SALVAGE CORPS.

The large block of buildings in the Southwark Bridge-road, built at the cost of the insurance companies for the London Salvage Corps, is now completed. It is opposite the new Chief Metropolitan Fire Brigade Station (illustrated in our pages some time ago), with which there is telegraphic communication. There is also telephone communication with the Watling-street Station.

The building has a frontage to Southwark Bridge-road of about 48 ft., and is about 55 ft. in height from pavement level. It contains a basement, ground, and four upper floors. Yellow malm bricks have been used, with Portland stone string-courses and cornices, the arched window-heads, window-jambs, and general ornamentation being in Brown's patent red brick. It is surrounded by a parapet-wall 4 ft. in height, inclosing a flat open roof covered with lead.

The upper floors have been arranged for members of the corps and their families. The first-floor contains the superintendent's apartments, consisting of two living-rooms, three bedrooms, kitchen, scullery, and bath-room.

The second, third, and fourth floors contain the apartments for the men, each suite consisting of a parlour, two bedrooms, and a kitchen.

The laundry is on the fourth floor, connected with a flight of steps leading to the lead flat, which is intended to serve for recreation as well as for drying purposes. The bath-rooms are also on the fourth floor. The suites of apartments are reached by a stone staircase and open galleries at the rear of the building.

On the ground-floor in the centre of the building is the carriage-room, 13 ft. in width, extending to the courtyard in the rear; the walls are faced with white enamelled bricks and a buff dado, the arches of doorways, &c., and the cornice at the ceiling, being in red Suffolk bricks. This floor also contains the superintendent's office, watch-room, carmen's room, stores, lavatory, &c.

In the basement are bath-rooms and lavatories.

In the rear of the ground-floor at the north end of the courtyard are the stables, with the carriage-drivers' apartments over them.

In addition to the main building just described a number of cottages on the east side of the courtyard and facing Lombard-street have been purchased, and fitted as additional residences for the corps. Between the main building and the cottages is a large courtyard in which are bath-rooms for the use of the occupants of the cottages.

The architect of the building is Mr. William Wimble; and the contractor, Mr. E. Laurence, of Wharf-road, City-road.

ASSOCIATION FOR THE REFORM AND CODIFICATION OF THE LAW OF NATIONS.

The seventh annual conference of this Association was opened on Monday, the 11th inst., in the Council Chamber of the Guildhall, by the Right Hon. the Lord Mayor, Sir Charles Whetham. His Lordship welcomed the members of the Association to the City, the Right Hon. Sir Robert Phillimore, president of the Conference, delivered the inaugural address, in which he said that a codification of the law of nations, if it were ever to be effected, must be the well-ripened fruit of wise delay. On the conclusion of the address, a cordial vote of thanks was accorded to Sir R. Phillimore, on the motion of Sir Travers Twiss.

In the report for 1878-9, which was next read, it was stated that, since the last conference, which was held last year, it will be remembered, at Frankfurt on the Main, the progress of the Association has been steadily maintained, 116 new members having joined during the year. The Association lost four members by death.

The exertions of the General Average Committee to bring about the introduction into practice of the York and Antwerp Rules have been continued with the most satisfactory results in Great Britain, the Scandinavian Kingdoms, Germany, Austria, Holland, Belgium, Russia, the United States, and the British colonies. It is more particularly deserving of notice that in England insurances upon the basis of the Rules can now be readily obtained at Lloyd's, more especially because that corporation was at one time opposed to the introduction of the Rules. On the other hand, in France and Italy, with a few notable exceptions, the Rules have met with little beyond an approval of their principles.

The Committee upon Negotiable Securities, appointed last year at Frankfurt, has been strengthened by the accession of bankers and other gentlemen interested on the subject, of Amsterdam, Berlin, Genoa, Hamburg, London, Milan, New York, and Vienna.

The movement in favour of uniformity of the laws of nations with regard to bills of exchange has extended to Holland, the Dutch Government having taken action upon a petition presented to it at the beginning of the present year by the Amsterdam Chamber of Commerce.

It will be remembered that the Committee upon Patents for Inventions and that upon Copyright held their annual meetings last year at Paris. The labours of the Parliamentary Sub-Committee upon Patents have unfortunately been rendered so far unproductive, through the House of Commons not having reached the second reading of the Patents Bill.

It should be added that, owing to the munificence of an anonymous donor, the finances of the Association are in a very flourishing condition.

On assembling on Tuesday morning, Professor Leone Levi read a paper on "International Copyright in Relation to the United States of America and other Foreign States." The lecturer said in the course of it:—The protection of literary and artistic property at home and abroad is a measure of simple justice due to those who contribute largely to the advancement of learning, science, and art, all over the world. Unlike patents, copyright does not restrict the use of human ideas and thoughts; it only applies to the language in which they are clothed, to the plan and arrangement in which they are presented,—to matters, in short, which reflect the personal characteristics of the author, which are, in a special sense, his own, and the restrictive use of which does not hinder human progress. Copyright is nowhere granted in perpetuity. Literary and artistic property, though fully recognised and established by municipal law as the product of human genius and labour, is, with a view to public convenience, and for sufficient reasons, restricted as to its duration. Perpetual copyright would, in most cases, be useless to the author and his representatives, and would unnecessarily trammel the diffusion of knowledge. A literary production, moreover, can scarcely be said to be the absolute creation of any one individual. An author enters, so to say, into a noble patrimony of learning, the common stock of knowledge, and though by his genius and research he succeeds in rearing a new structure, he is nevertheless beholden for many of his materials to those who left the rich legacy. Thus narrowed in respect to matter and time, copyright is nevertheless a fit recognition of literary property, and in an age when thoughts and ideas are communicated with unexampled rapidity, in an age when a constant interchange is taking place of the products of learning, art, and industry, between all countries, it scarcely befits any civilised state to say that the rights of an author should be limited to the narrow boundaries of his own nationality. The exclusive laws of former days, the "Droit d'Aubaine" and the "Loi de Détraction," were long ago expunged from the statute-book. The courts of justice are open to foreigners and natives alike, and it is only just and fair that, if I possess in England a literary property over my own work, I should be able to follow and prosecute the invader of that property, be he in the United States or in any other quarter of the world, and that a Frenchman or an American possessing a right of property in his work in his own country should equally be entitled to the protection of the courts here in the same manner as any Englishman. For my part, I cannot subscribe to the dicta pronounced in the English Court of Chancery, before the conclusion of copyright treaties, "that the Court does not protect the right of a foreigner"; or "that the policy of our law recognised by statutes express in their wording that the importation of foreign inventions shall be encouraged in the same manner as the inventions made in this country and by natives; this is founded as well upon reason, sense, and justice, as it is upon policy." Such opinions seem to me to be illiberal in principle, and founded on too restricted a view of the right of property. Literary property is as sacred as any other description of property, and it makes no difference whether it is created at home or abroad. If so, no need should there be of international copyright, in order to admit foreign literary property to the protection of the courts. Not to recognise the right is vandalism. It is piracy, which no civilised state should permit. Regarded in its international aspect, the question presents the greatest difficulty in relation to states using the identical language, yet separated in territorial jurisdiction. This was the case in Germany until 1827, when Prussia entered into special treaties on the subject with other German states. And this is just the point which divides at present the United Kingdom from the United States of America. Both use the same Anglo-Saxon tongue. Both consider themselves the inheritors of a literature at once rich and elegant, the possessors of the same classics, and alike interested in the preservation and development of their language. The older sister is more prolific, more inventive, and more advanced in the production of works of science, literature, and art. The younger affords probably the widest scope for their diffusion. Nevertheless, there is no mutual recognition of literary right between them. Consequently, a United States author publishing a work first in the United States has no right of protection against piracy in the courts of justice in the United Kingdom, and a British author publishing a work first in the United Kingdom has no *locus standi* before the American courts. Surely such a state of matters is not becoming states so advanced in civilisation and so friendly in their relations. It is not creditable to either party. Surely it should not be necessary to enter into a treaty for the fulfilment of a simple act of justice. Lord Chancellor Cairns, in the case of Routledge *v.* Low, said that "the aim of the Legislature is to increase the common stock of the literature of the country." But whatever be the aim of the statute, its principle is that it recognises and guarantees literary property, and it is narrowing that principle in an unjustifiable manner to apply it to literary property first created in this country. A more liberal interpretation of the Act would render international treaties on the subject superfluous, at least for the recognition of the right. England, however, is ready to concede to the United States a perfect right of property in American literature if she will only enter into a treaty as other states have done.

After referring to the direct negotiations which have been carried on between the two governments, without any beneficial result, the lecturer asked what is it that the United States allege as a justification against international copyright? They plead that copyright would enhance the cost of literature, and thereby prove a barrier to the diffusion of literature and learning in the United States. The latter grant copyright to an American citizen. Why refuse the same protection to a foreigner when any other description of foreign property is scrupulously protected? The lecturer denied that international copyright would check the diffusion of literature and learning in the United States; on the contrary, it is certain to give a needed stimulus to American literature. It is high time that the two civilised states should come to an understanding. There is no intention on the part of England to retaliate on America by withdrawing from Americans the privilege of copyright on first publication in this country, whatever be the result of further negotiations.

M. Clunet (Paris) expressed his satisfaction at the views of Professor Leone Levi, and said that, although they were not so far advanced in America, they were advancing in the direction of international law of copyright.

General Grant Wilson (New York), speaking on behalf of the United States, remarked that there was a great probability of a measure on the subject being introduced into Congress, and of an agreement with Great Britain being arrived at.

After Mr. Freeland had spoken, and some further discussion, the matter was referred to the committee to consider.

The conference here adjourned, and assembled again in the afternoon, when the subjects of negotiable securities and bills of exchange were discussed, after which the conference adjourned till Wednesday.

MONASTERY AT ERDINGTON.

The foundation-stone of the first portion of St. Thomas's Priory, a new monastery in course of erection at Erdington, near Birmingham, for the Fathers of the Order of St. Benedict, was laid on the 5th instant by the prior, the Rev. Hildebrand de Hemptinne.

The new priory will be built of Kenilworth stone on a site adjoining the Roman Catholic Church of SS. Thomas and Edmund, with which there will be a communication by a cloister, and when finished will form a complete group of ecclesiastical buildings of the old monastic type.

The plans have been prepared by Mr. A. E. Dempster, architect, of Birmingham, under whose superintendence the work is being carried out by the contractor, Mr. J. Garlick, of Saltley Works.

COMPETITIONS.

Greenock Corporation Buildings.—We are informed that the following are the six plans which Mr. Barry in his report recommended to the town council, with the relative cost of each in round numbers:—1st, "Art and Science," 88,000*l.*; 2nd, "Omega," 64,000*l.*; 3rd, "Let Greenock Flourish," 73,000*l.*; 4th, "Qui dit Progrès dit Labeur," 70,000*l.*; 5th, "Ciconia," 83,000*l.*; and, 6th, "M.B.," 70,000*l.* These six plans have been placed in the hands of Mr Robert Scott, of Glasgow, who was recently appointed measurer for the new buildings, who will check the estimates, and it is quite possible that the estimated cost of each, or at least of some of them, as given above, may be altered. The plan having attached to it the motto, "Art and Science," which Mr. Barry has placed first in the order of merit, is said to be the work of Messrs. H. & D. Barclay, Wellington-street, Glasgow. The various architects were limited to the sum of 80,000*l.* as the estimated cost of the buildings.

Gateshead Workhouse.—At a meeting of the Gateshead Board of Guardians, on the 5th inst., the Chairman (Mr. Alderman Hindmarsh) moved that the Local Government Board be asked to give their consent to the Board spending 25*l.* as a premium for a plan showing how the present workhouse could be so extended as to meet the requirements of the authorities. He stated that the cost of the proposed works would be about 3,000*l.* One of the Guardians, Mr. Reid, said there was no need to spend such a sum as 25*l.* for a plan when their architect, Mr. Newcombe, could provide them with one. After some further discussion, Mr. Lamb moved, and Mr. Montgomery seconded, an amendment that the matter stand over for discussion at the next meeting of the Board. It having been suggested that 25*l.* was a small sum to offer, the Chairman said that he would double that amount in his motion. The Chairman then put the amendment to the vote, when eight voted for it and eight against it. The Chairman gave his casting vote in favour of his own motion.

Bushey Schools.—The Board decided to invite

designs, under motto, from seven architects, for the new girls' and infants' schools, under one roof. The choice fell on that marked "Success," the author being Mr. H. H. Bridgman, architect, who has since received instructions to obtain tenders.

Billiard Tables.—A few months ago Messrs. Orme & Sons, billiard-table manufacturers, Manchester, intimated their intention of offering 120*l.* in prizes for the best designs for billiard-tables and markers that might be submitted to them for exhibition. Mr. W. J. Muckley, of the School of Art, Bond-street, Mr. E. Salomons, architect, and Mr. James Lamb, cabinetmaker, consented to act as judges, and the prizes having now been awarded, the exhibition will be at once opened at Messrs. Orme's rooms. Altogether upwards of 200 designs have been sent in. The following are the prizes awarded:—Class I., 50*l.* prize for the handsomest design for a billiard-table of any style, Mr. L. A. Shuffrey, London. Class II., 25*l.* prize for the best design for a billiard-table suitable for a house of no special style or character, Mr. J. Ainsworth, Elton, near Bury. Class III., 15*l.* prize for the best design for an inexpensive billiard-table, Mr. A. Hall, Leicester. Class IV., for the best design for a marking-board, Mr. F. G. Knight, London. Class V., 20*l.* prize for the best sketch of an interior of a billiard-room, ideal or otherwise, Mr. H. Jewitt, Manchester.

CANDIDATES SUCCESSFUL FOR THE WHITWORTH SCHOLARSHIPS, 1879.

Name.	Age.	Occupation.	Address.
Hardisty, John ...	20	Engineer	Manchester.
Harrison, George .	20	Millwright	Oldham.
Shaw, Edward.....	19	Engineer Apprent.	Bristol.
Simpson, John A..	21	Engineer	Birkenhead.
Geddes, John W...	20	Mechanic	Oldham.
Harris, Sydney J..	21	Engine Fitter	Crewe.
Sackfield, Thos. E.	20	Mechanic	Crewe.
Brodie, John A. ...	20	Engineer Apprent.	Liverpool.

DOME OF THE ROCK.

SIR,—A letter, addressed by Mr. E. C. Robins, F.S.A., to the president of the Royal Institute of British Architects, appears in their Transactions for 1878-9.

Mr. Robins compares two churches at Rome, one round, one octagonal, to the Dome of the Rock at Jerusalem. I should like to be allowed to ask for further information on the subject, as one in which I take interest:—

1st. Do either of the Roman churches present the distinctive feature of a wooden beam running from pillar to pillar, as in the Dome of the Rock, the Dome of the Chain, and many other domed buildings in the mosques of Jerusalem, Damascus, and Cairo?

2nd. Is it certain that the present structure of Sta. Constanza is the work of Constantine, or that the mosaics are fourth-century work? Mosaic ornamentation was much in use (at least in the East) in the thirteenth century, at which period Sta. Constanza was, according to Mr. Robins, "turned into a church." Imitations of the Templum Domini, or Dome of the Rock, are also known to have been built by the Templars in Europe.

3rd. Is it certain that St. Giovanni in Fonte is the work of Constantine?

I would also beg to point out, in order to prevent any misconceptions arising, that Eusebius, in describing the work of Constantine at the supposed site of the Holy Sepulchre, makes no mention of either a round or an octagonal church of Anastasis. He describes only a basilica with an atrium; gates opening to the market of the city, and a *hemisphairon*, or large apse surrounding the Holy Sepulchre.

According to contemporary historians, these works were entirely destroyed in 614 A.D., and it is not until 700 A.D. that we have any account of the Round Church of the Anastasis which most authorities ascribed to Modestus, who replaced the single structure of the basilica by four small separate buildings.

As regards the site of these buildings, the fourth and fifth century writers place them in the middle of Jerusalem and north of the traditional site of Sion,—a position wholly irreconcileable with that of the Dome of the Rock.

With regard to the architectural style of the Roman buildings under consideration, I would point out that in San Giovanni in Fonte the pillars support a horizontal cornice with a second order of lighter shafts above,—a disposition which is not found in the Dome of the Rock. As regards round arches I have already pointed out in your columns that the arches of the Dome of the Chain (which Mejr-ed-Din states to have been the model for the Dome of the Rock) are semicircular, so that the use of round arches by Arab builders is clearly established.

C. R. CONDER, Lieut. R.E.

"EXTRAS" IN THE NEW THEATRE, PLYMOUTH.

AT the quarterly meeting of the Plymouth Town Council, on the 6th inst., the Land Committee reported that the total cost of the theatre restoration amounted to 7,060*l.*, being 481*l.* in excess of the amount of the contract. The committee much regretted that the contract price should have been exceeded by so large a sum, and the more so as they took every precaution to prevent any additional expense being incurred, and obtained repeated assurances from Mr. Phipps (the architect) that there would be none. Until the account for extras was actually delivered, they were unaware of any additional works having being executed, with the exception of one item, viz.,—the bonding of the roof, which they had ordered, at a cost of 26*l.* The committee distinctly affirmed that they gave no authority to Mr. Phipps to execute any additional works, all of which, with the exception before referred to, had been carried out without their knowledge or approval. Inasmuch, however, as Mr. Phipps, acting as the architect of the Council, had certified that the additional amount was payable, the committee could not but recommend payment to the contractor.

Mr. A. S. Harris moved the adoption of the report, and Mr. J. Marshall seconded the motion.

The Town Clerk stated that he had received a letter on the subject from Mr. W. Derry, the chairman of the Land Committee, who was unavoidably absent that day. The writer said:—

"The only extra item which has received the sanction of the committee is the amount of 26*l.* for extra bonding the roof and giving increased security to it, in deference to the decided opinion of the contractor that it was necessary. On the other hand, Mr. Phipps was reminded on several occasions by myself and other members of the committee that as we were in the position of trustees of the public money, any departure from or increase in the amount of the contract would be resisted, and he more than once gave us an assurance that our instructions should be implicitly adhered to. Yet, notwithstanding this, it transpired that at that moment extras to the amount of 200*l.* had already been incurred, and I distinctly remember when on one occasion the committee visited the theatre they were asked to sanction an extra for roofing a passage, but they refused to do so, and Mr. Phipps then said he would pay for the thing himself. These and other matters having reached the serious total of 481*l.*, it became a question to the council whether, remembering the repeated cautions the architect received from the secretary, and his repeated assurances of obedience with our instructions, that the council should not throw on him the responsibility of this liability. I am quite willing to admit the contractor has done this extra work and must be paid, but I maintain that if it be proved that the architect has disregarded the peremptory instructions and repeated cautions of the committee, on him alone should rest the responsibility."

The Town Clerk also said that he had received several letters on the subject from Mr. Phipps, and the latest, dated July 31st, had not yet been under the consideration of the committee. In it Mr. Phipps said:—

"I have to acknowledge receipt of your letter of July 28, and it would be as well for me to call your attention to Clauses 7 and 8 of the contract, and, at the same time, I beg to disclaim having in any way given orders involving extras. I was specially careful not to do so, and the few matters I did order were at the time fully counterbalanced by omissions. Many works were done by order of the clerk of the works and Mr. Newcombe as being necessary for the building, which, when the measurements took place, I was bound to sanction as additional under Clause 7. But, as I said before, it is a question of measurement; the plans and specifications have not been deviated from, but more work is done than appears in the schedule of quantities, which must be paid for. If less had been done there would have been a deduction. I have nothing to do with the quantities; they were prepared by an independent surveyor, who measured the works up afterwards, and Clause 1 of the contract is in error when it states the priced estimate to be signed by me. It is signed by the surveyor, who took them out in the usual way."

After a somewhat acrimonious discussion, the committee's report was adopted by twenty-six to four.

Newport, Monmouthshire.—The Great Western Railway Company are considerably enlarging their station here by the erection of new station buildings, offices, bridges, platforms and approaches, at a cost exceeding 25,000*l.* The contractor is Mr. Charles Claridge, of Banbury, who is pushing forward the work with all possible speed.

VALUE OF SANITARY WORKS.

IN the last quarterly report of the Registrar-General a piece of very strong evidence is given of the value of sanitary works. The town of Llandudno has recently been sewered, under the direction of Mr. Baldwin Latham, C.E., at a cost of upwards of 30,000*l.*, and a new scheme of waterworks has been undertaken at a still greater cost. During the past quarter Llandudno is shown to have been the healthiest of all the watering-places or health resorts in the country, having had a rate of mortality of but 8·4 per 1000, while no death was recorded from any zymotic disease. The rural district outside Llandudno, which has not received any sanitary attention, and is in a neglected and unsanitary condition, has had in the same period a death-rate of 38·6 per 1,000, and a zymotic death-rate of 4·3 per 1,000. The Registrar-General adds to his report that the enterprise and public spirit shown by the town "is thus entitled to reap, as it does, the credit and benefit it has so well earned."

LIGHT CASE.

DOIG *v.* GAMB.

THIS was an action, before Vice-Chancellor Sir C. Hall, by the proprietor of the "Windmill," Nicholas-lane, City, to restrain interference with the access of light and air to his premises by the operations of the defendant, who had recently demolished adjoining premises and erected new buildings on the site to, as the plaintiff alleged, a greater height than that of the buildings they had replaced.

After considerable argument it was arranged that the matter should be referred to the President of the Institute of British Architects to decide the extent of the injury, if any, done to the plaintiff, and the amount of compensation to which he was entitled.

Books.

Town and Window Gardening, including the Structure, Habits, and Uses of Plants. By CATHERINE M. BUCKTON, Member of the Leeds School Board. 127 Illustrations. London: Longmans, Green, & Co.

ABOUT three years ago the author offered prizes for window-garden boxes to children from the Leeds Board Schools who attended her lectures on the "Laws of Health." The result gained by two years' experience in awarding these prizes showed her that window-gardens are very difficult gardens, and that it is impossible for children or men to become good gardeners unless they understand the structure, nature, and growth of plants. Failing to find an easy book with the necessary information, the writer studied the best authors, procured at Paris Dr. Auzoux's beautiful models of plants, and then delivered the lectures which form the present volume, the lectures being occasionally followed by a practical lesson on preparing the soil and drainage in the box or flower-pot, and either sowing seeds or planting cuttings, bulbs, &c.

It is a very interesting and valuable little book, but a little over the heads of the majority of those for whom it is intended. It would do good in schools.

VARIORUM.

THE Great Eastern Railway's "Tourist-Guide to the Continent" (125, Fleet-street) contains 150 pages of readable letterpress, by Mr. Percy Lindley; fifty sketches of interesting places and people, by Birket Forster, J. Temple, Alfred Bryan, and others; a coloured map; and all for 6d. It alludes to Holland, Belgium, the Rhine, Germany, Switzerland, and Italy. It will be found useful by many who want to know where they shall go.——"House Invasion and Defence" (Knight & Co), by C. W. Lovesy, M.A., discusses what a man may or may not do in defence of his house. The object Mr. Lovesy has in view is to show that a man, standing in defence of his homestead with a six-shooter in his hand, has a good many serious questions to ask himself before he "burns powder," albeit placed in trying circumstances.——A Midsummer edition of Bevis's "Builders' Price Book and Guide for Estimates," has been published (8, St. Martin's-place), in which the author claims to have revised the prices to meet present values. Useful suggestions as to esti-

mating are given in connexion with the several divisions. It is a handy little book.——"The Gas and Water Companies Directory," for the year 1879, edited by Charles W. Hastings (Marcus Ward & Co., Belfast), contains a large amount of statistical information especially useful just now.——"Symons's British Rainfall," 1878 (E. Stanford, 1879), gives the observations made at about 2,000 stations, besides a full account of all known forms of self-recording rain-gauges. The science of weather is about to take a new and important shape.

Miscellanea.

Safety of the Alhambra.—Some few weeks ago there appeared in the *Times* a statement to the effect that, owing to a serious landslip, the Alhambra at Granada was in great danger of destruction. Mr. R. Herbert Carpenter now writes:—"Having but recently seen the building, and having noticed nothing which indicated this danger, I made inquiries, and am very happy to be able to say, on the authority of Mr. H. Stanier, her Majesty's Vice-Consul at Granada, and of Señor Contreras, the resident architect of the Alhambra, that not only is there no fear whatever of any collapse, but that there is no landslip nor any indications whatever of one being likely. 'Not a single pebble or grain of earth has been observed to fall,' says Mr. Stanier, 'though there are often earthquakes here.' Similar alarming statements have appeared in the Madrid and in some of the chief Continental papers, but all seemed to be based on local sources of information, there having been some agitation in Granada to try and induce the authorities (besides restoring a ruined Moorish gateway quite distinct from the Alhambra) to build a great retaining-wall in a hollow of the Alhambra hill, formed ages ago by the River Darro. There has, however, been no change in this hollow (nor does the Darro now rise high enough to effect a change) since the Alhambra walls were built over it 600 or 700 years ago. This proposed wall is considered by Señor Contreras to be quite unnecessary, and this is also the opinion, I am told, of the Government engineers who have considered the matter."

The Water Supply of the Metropolis.—In the House of Commons on Wednesday, the adjourned debate on this subject was resumed by Mr. Fawcett, who moved,

"That in view of the fact that the Metropolitan Board of Works has been unable to pass any measure dealing with it, this House is of opinion that it is a subject which ought, without further delay, to be dealt with by the Government."

Mr. Sclater-Booth said the subject was under the consideration of the Government, but no explicit statement must be expected from them now. Mr. Cross promised, on behalf of the Government, that the subject should be fully looked into in all its bearings before next Session, to ascertain whether the water supply of the Metropolis could be improved without any material increase in the cost, and whether it would be necessary to call on the companies to surrender their powers into the hands of some central body appointed by the Government. But it must be understood that if the Government undertook any scheme of that kind, no action which the companies might take, no speculative arrangements into which they might enter, no prospective addition which they might make to the value of their shares, would be taken into account. The Government would take the shares as they found them, say, at the last day of the last half-year. Mr. Fawcett withdrew his resolution.

Liverpool.—At a meeting of the Liverpool Town Council on the 6th inst., it was resolved,—

"That the Council having resolved that the offices of borough engineer and water engineer should be divided, it be referred to a special Committee, consisting of four members of the Health Committee and four members of the Water Committee, with one member added, to consider and report to the Council their recommendation as to the duties of the respective officers, and the salaries to be paid to them."

Death of Mr. James Robinson.—We regret to have to announce that Mr. James Robinson, secretary to the Social Science Association, expired on Tuesday, at his residence, Fentiman-road, Clapham-road. He was held in the highest esteem by the members of the Social Science and Law Amendment Societies, and his loss will be severely felt at the approaching congress.

Steel.—Messrs. Matheson & Grant, in their Engineering Trades Report, say:—"The use of steel has not been so rapidly extended as its more sanguine advocates predicted; but those who are best informed are more than ever certain of its ultimate triumph. Extra prices for the purchase of steel rails rather than iron rails have no longer to be justified, for the direct and simple methods of steel-making are proving to be less costly than those of making iron through the intermediary process of puddling. Indeed, the iron rail trade seems practically at an end. There is the apparent anomaly that at certain steel-works having no obvious local advantage, rails can be produced without loss at prices impossible to other makers. Improvements and economies in the various processes of [steel-making have followed rapidly during the last few years, and the newer works benefit by the dearly-bought experience of the older works; every such advantage, however small, telling forcibly during the present keen competition."

South London Art Exhibition.—The opening of this exhibition, in the rooms of the Working Men's College, 143, Upper Kennington-lane, took place on Thursday. The chief portraits are lent by Sir Charles Dilke, M.P., and include one of Mr. J. S. Mill, by Watts; one of Professor Fawcett, by Madox Brown; and one of M. Gambetta, by Le Gros. Mr. P. A. Taylor, M.P., has lent a large number of works, including some by Goodwin, Webb, Stanfield, Moore, &c. Mr. Woolner, R.A., also lends several works, including Turners, Cotmans, Reynoldses, and Nasmyths. There are also pictures by Guido, Spagnoletti, Hogarth, and Sir F. Leighton. The exhibition will be open free, on weekdays from two till five and from seven till ten p.m., and on Sundays from six to ten p.m.

Public-House Property.—In the course of a sale, at the Mart, by Messrs. Debenham, Tewson, & Farmer, of freehold properties, situate in and near to Long-lane and Crosby-row, Bermondsey, the Coach and Horses, a fully-licensed public-house, and two cottage tenements adjacent, let together, on lease, expiring at Midsummer, 1881, at 60*l.* per annum, were put up. They excited most vigorous competition, and eventually realised 5,500*l.* The premises are small, and possess a frontage of 20 ft. only to Long-lane; but it was stated that the house has a well-established reputation, and is the seat of a large business. Even if it be so, the price is extraordinary.

National Hospital for the Paralysed and Epileptic.—The history of the foundation of this establishment by two ladies some twenty years ago, with its Samaritan Fund and Convalescent Branch, is very interesting and encouraging. It has been well supported, too, and done much good, but just now help is needed, and those who would like to know more about and help on a good work should address Miss Johanna Chandler, 43, Albany-street, N.W. The Samaritan Society has special claims on the sympathy of women; "its administrative committee is composed exclusively of women, and its benevolent purposes are carried out by the unwearied labours of women."

Cavendish College, Cambridge.—As we have already mentioned, a further extension of this college is contemplated, and we now learn that the works are being commenced. Accommodation is being provided for thirty additional students, and later in the year it is in contemplation to erect temporary accommodation for about twenty-five more students. Messrs. John Giles & Gough, of London, are the architects.

St. Paul's.—A design for the decoration of the dome of St. Paul's Cathedral, by Mr. R. P. Pullan, architect, and Mr. C. Heath Wilson, is now on view in the gallery of the Universal Fine Art Society, Egyptian Hall, Piccadilly. We have already given a few particulars of the design.

Lowestoft.—At a meeting of the Lowestoft Improvement Commissioners on the 11th inst., it was unanimously resolved to make an addition of 50*l.* a year to the salary of the surveyor, Mr. Robert H. Inch.

Fall of Warehouses, New Oxford-street. At the end of last week, a fall of houses occurred in a thoroughfare known as Dyott-street, New Oxford-street. There was no loss of life. They seem to have been a heap of rubbish waiting the first opportunity to fall.

The Social Science Congress.—It is announced that the Bishop of Manchester has accepted the office of president for the ensuing meeting; that Lord Reay has accepted the office of president of the Economy and Trade department; Sir Coutts Lindsay that of the Art department; Mr. F. S. Powell that of the Health department; Sir Travers Twiss that of the Jurisprudence department; and the Hon. Lyulph Stanley that of the Education department.

TENDERS

For alterations and additions to the Agricultural Hall, Walsall. Mr. Samuel Loxton, architect. Quantities by the architect:—

James Davis & Son	£2,745 0 0
Wistawe	2,500 0 0
Bethell	2,500 0 0
Evans	2,178 15 0
Pilshaw	2,176 0 0
Wiley	2,124 18 0
Trow & Sons	2,100 0 0
Crutchley	1,923 0 0
Pritchard & Feltham	1,897 0 0
Jones & Sons	1,885 0 0
Millward, executors of (accepted)	1,693 15 6

For the erection of thirteen houses in Albert-road, Walthamstow, for Mr. N. Argent. Mr. Edward Brown, architect:—

Perry & Co.	£5,460 0 0
Outhwaite and Son	5,243 0 0
Hearle & Son	5,085 0 0
Marr	4,978 0 0
Gaan	4,841 0 0
Salt	4,600 0 0
Good (accepted)	4,138 0 0

For pumping station, sewerage works, Lincoln. Mr. J. Mansergh, engineer. Quantities provided:—

Barnes & Wright	3,055 0 0
H. S. & W. Close	2,902 11 10
Kellett & Bentley	2,704 0 0

For additions and alterations to Lincoln Lunatic Hospital. Mr. M. Drury, architect. Quantities provided:—

Martin & Sims	£865 0 0
Morgan	841 14 0
Hatcliffe	837 6 7
Baines	811 10 0
Barnes & Wright	799 0 0
Thorpe	789 7 4
Otter & Elsey	769 10 0
Chambers	750 0 0
Taylor	725 0 0
Crossby & Sons	690 10 0
Cliffe & Cox	625 1 10

For completing No. 2, Serle-street, for Mr. Young. Mr. R. Groom, architect:—

Nash (accepted)	£550 0 0

For two studios at Haverstock-hill, for Mr. Bellamy. Mr. R. Groom, architect:—

Robinson	£1,444 0 0
Langmead & Way	1,289 0 0
Nash	1,245 0 0
White (accepted)	1,137 0 0

For erecting a pair of semi-detached residences in Copleston-road, Choumert-road, Peckham-rye. Mr. E. C. Stimson, architect:—

Payne	£1,175 0 0
Terry (accepted)	1,094 0 0

For alterations and additions at Broad Oak, near Bexhill, Sussex, for Colonel H. Lane. Mr. Edward Cook, architect:—

Langmead & Way (accepted).

For alterations and additions to The Lamb public-house, Lamb's Conduit-street. Messrs. Johnstone & Paine, architects. No quantities:—

King	£1,490 0 0
Axford	1,400 0 0
Langmead & Way (accepted)	1,351 0 0

For Skegness Promenade Pier, Lincolnshire. Messrs. Clarke & Pickwell, engineers. Quantities by the engineers:—

Contract No. 1.

Butterley Ironworks	£25,118 1 9
Hutton & Coventry	22,200 11 6
Laidlaw, Sons, & Caine	21,044 0 0
Stockton Forge Company	20,166 13 2
Rolin & Co.	19,872 18 7
Handysides & Co.	19,635 0 0
Eckersley & Williams	19,500 0 0
Bridge and Roofing Co.	17,152 10 2
Head, Wrightson, & Co. (accepted provisionally)	16,859 2 0
Bergheim & Co.	16,764 14 10

Contract No. 2.—For ornamental saloon, refreshment-rooms, &c.:—

Laidlaw, Sons, & Caine	£4,598 0 0
Hutton & Coventry	4,378 14 4
Rolin & Co.	4,281 2 11
Kirk & Parry	3,796 8 7
Head, Wrightson, & Co.	3,659 18 0
Dunkley	3,600 0 0
Young & Akrigg	3,539 0 0
Holmes & Wallhead	3,536 0 0
Handysides & Co.	3,399 9 8
Brown, Toogood, & Co.	3,358 1 8
Macfarlane	3,161 16 5

For the erection of a farm residence and homestead at Hersham, near Walton-on-Thames, for Mr. Edward Raphael. John Gordon Picking, architect:—

Wright	£1,125 10 0
Light (accepted)	996 15 0

For the restoration of St. Mary's Church, Tickhill. Mr. J. M. Teale, architect:—

Smith & Co.	£1,200	0	0
Denison	747	3	0
Langley	725	0	0
Anelay	711	7	0
Tomlinson & Sons	700	0	0
Rawson & Co. (accepted)	7 0	0	0
Flowitt	694	0	0
Jackson & Son	694	0	0
Chadwick & Co.	627	0	0
Dennison	576	0	0

For the erection of a mission-hall in Glengall-road, Manchester-road, Cubitt Town. Mr. H. H. Bridgman, architect. Quantities by Mr. F. Thomson:—

Hunt, amended tender (accepted)	£826	17	1

For the erection of a villa residence in Woodville-road, Hadley-by-Barnet, for Mr. J. B. Poole. Mr. H. H. Bridgman, architect. Quantities by Mr. F. Thomson:—

Burman	£2,740	0	0
W. & H. Castle	2,627	0	0
Manley	2,499	0	0
Scrivener & Co.	2,440	0	0
Frost & Co.	2,419	10	0
Toms	2,390	0	0
Staines & Son	2,384	0	0
Sims	2,365	0	0
Niblett	2,330	0	0
Moreland & Nixon	2,300	0	0
Kirk & Randall	2,292	0	0
Niblett	2,290	0	0
Gould & Brand	2,275	0	0
Hunt	2,250	0	0
Chinnock	2,209	0	0
Somerville & Hill	2,197	0	0
Richardson Bros.	2,175	0	0
Taylor (accepted)	2,089	17	3

For extensions to the Camden Turkish Baths, 11A, Kentish Town-road. Mr. H. H. Bridgman, architect:—
Hunt (accepted) by schedule.

For two warehouses, Bucknell-street, Oxford-street. Mr. W. S. Trehearne, architect:—
W. B. Downs & Co. (accepted).

For seven houses, Chiswick. Mr. T. Roger Smith, architect:—
W. B. Downs & Co. (accepted).

For house at Woodford. Mr. J. J. Stiles, architect:—

Tillett	£1,060	0	0
Day	831	0	0
Cox	830	0	0
North Bros.	807	0	0
Wood (accepted)	720	0	0

For erecting house and shop, High-street, Hampstead. Mr. J. Tanner, architect. Quantities supplied:—

Eaton	£1,160	0	0
Hobson	1,146	0	0
Hayworth	1,127	0	0
Butcher	1,045	0	0
Mustoe	1,000	0	0
Grey (accepted)	960	0	0

For pulling down and re-building 13, Air-street, Regent-street, for Mr. Stokes. Mr. Shaw, architect:—

Sneesham	£1,789	0	0
Warne & Son	1,637	0	0
Jackson & Todd	1,520	0	0
Hobson	1,467	0	0
Bywater	1,440	0	0
Jerratt	1,318	0	0
Taylor & Parfitt (accepted)	1,199	0	0

For repairing seven houses, York-road, City-road, for Mr. Mace:—

Taylor & Parfitt (accepted)	£475	0	0

For the erection of shops and warehouses in Bethnal Green-road, for Messrs. Nicholson & Sons. Messrs. Gordon & Lowther, architects:—

Browne & Robinson	£7,846	0	0
Thoms	7,689	0	0
Tully	7,320	0	0
Brand & Co.	7,052	0	0
Thomerson & Son	7,025	0	0
Farrah & Son	6,990	0	0
Lauder & Son	6,775	0	0
Forrest	6,695	0	0

For erection of pair of semi-detached cottages in the Glenhurst-road, Brentford, for Mr. F. J. Evans. Messrs. Smithies & Gladman, architects:—

Falkner	£784	0	0
Nye	705	0	0
Taylor	644	0	0
Brunsden	600	0	0
Beauchamp	597	0	0

For additions to farm-buildings, Manington Estate, for Mr. Lewis R. Price. Mr. Evan Powell, architect. Quantities supplied:—

Cross	£590	0	0
Morgan	490	0	0
Weale	488	2	0
Geltria	450	1	0
Davies	442	3	1
Lockley	434	0	0
Price	415	15	0
Birrell	402	0	0
Hughes & Son	374	16	1
Price & Son (accepted)	360	0	0

For alterations and additions to Penymaes House, for Mrs. Evans. Mr. Evan Powell, architect. Quantities not supplied:—

Birrell	£1,000	0	0
Price & Son (accepted)	780	0	0

For pair of cottages and outbuildings, Little Marrington, for Mr. Lewis R. Price. Mr. Evan Powell, architect. Quantities supplied:—

Lockley	£643	0	0
Phillips	632	9	5
Smitheman	597	10	0
Geltria	545	14	0
Price & Son	530	0	0

For additions to farm-buildings at Bodaioch Farm, for the trustees of the late General Worsnam. Mr. Evan Powell, architect. Quantities supplied:—

Williams	£403	18	10
Woolley	390	0	0
Phillips	359	2	7
Breeze (accepted)	339	1	0

For cemetery chapels, entrance lodge, fence, walling, and outbuildings, for the Burial Board of the parish of Llanidloes. Mr. Evan Powell, architect. Quantities not supplied:—

Williams	£1,750	0	0
Jannan	1,487	11	0
Meredith (accepted)	1,385	0	0

For alteration to "George and Dragon" public-house, Cleveland-street, Tottenham Court-road, for Mr. Joseph Newport. Mr. Robert Emerie Tyler, architect:—
Somerville & Hill (accepted) £1,050 0 0

Boys' School at Arundel for the Duke of Norfolk.—The quantities were prepared by Mr. Henry Smith, of John-street, Adelphi.

CHARGES FOR ADVERTISEMENTS.

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS TRADE, AND GENERAL ADVERTISEMENTS.

Six lines (about fifty words) or under ..... 3s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

Terms for series of Trade Advertisements, also for Special Advertisements on front page, Competitions, Contracts, Sales by Auction, &c. may be obtained on application to the Publisher.

SITUATIONS WANTED.

FOUR Lines (about THIRTY words) or under ..... 2s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

REPLIES TO ADVERTISEMENTS,

Addressed Box ——, Office of "The Builder,"

Cannot be forwarded, but *must* in all cases be *called for*, and the Office Receipt produced.

THE CHARGE FOR A BOX IS AS UNDER:—

For "Situations Wanted" Advertisements ..... 2d. per Week.
For all other Advertisements ..... 6d. per Week.

PREPAYMENT IS ABSOLUTELY NECESSARY.

*** Stamps *must not* be sent, but all small sums should be remitted by Cash in Registered Letter or by Money Order, payable at the Post-office, King-street, Covent-garden, W.C. to
DOUGLAS FOURDRINIER, Publisher,
Addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the office before THREE o'clock p.m. on THURSDAY.

The Publisher cannot be responsible for TESTIMONIALS left at the Office in reply to Advertisements, and strongly recommends that COPIES ONLY should be sent.

TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied *direct* from the Office to residents in any part of the United Kingdom at the rate of 18s. per annum, *prepaid*. Remittances payable as above.

TO CORRESPONDENTS.

A. E. D.—C. C.—E. P.—G. W.—G. N.—M. P. B.—W. S. S.—M. & S.—H. R.—C. R.—C. C.—G. M.—F. J. B.—W. W.—G. H. W.—T. P.—J. R.—J. M. T.—T. C. S.—Progress.—R. L.—W. H. F.—R. G.—C. & P.—S. & G.—A Candidate.—Dr. P.—S. F. C.—W. T. & Son.—W. R. D. & Co.—E. P.—H. H. B.—W. F. O.—T. & P.—J. T.—M. Bros.—J. O'C.—D. S.—S. & H.—Surveyorships to local boards (a number of letters on this subject will have consideration next week).—Carving and Gilding (next week).—E. Aldis (does not describe his mode of forming flat roofs sufficiently to be understood).—W. D. S. M. (will appear).—T. R. S. (next week).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles and papers read at public meetings, rests, of course, with the authors.

Bath Stone of Best Quality.
RANDELL, SAUNDERS, & CO. (Limited), Quarrymen and Stone Merchants.
List of Prices at the Quarries and Depôts; also cost of transit to any part of the Kingdom, on application to
Bath Stone Office, Corsham, Wilts. [Advt.]

Bath Freestone in Blocks of all sizes, warranted sound, and delivered at any Port or Railway Station.—YOCKNEY & COMPANY, Sole Owners of the CORSHAM DOWN QUARRY, Corsham, Wilts, to whom all letters should be addressed. [Advt.]

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to CHARLES TRASK, Norton-sub-Hamdon, Ilminster, Somerset. Agent: E. Crickmay, 4, Agar-street, London, W.C.—[Advt.]

Asphalte.
Seyssel, Patent Metallic Lava, and White Asphaltes.
M. STODART & CO.
Office:
No. 90, Cannon-street, E.C. [Advt.]

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 38, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tan-rooms, and terraces. [Advt.]

J. Sessions & Sons, Docks, Gloucester, Manufacturers of ENAMELLED SLATE and MARBLE CHIMNEY-PIECES, URINALS, &c. WELSH ROOFING SLATES direct from Quarries to any Station in the Kingdom. Manufacturers of Joinery & Mouldings. [Advt.]

Whitland Abbey Green Slates.—These slates are of a grey green tint, are stout, and made in all sizes. A large stock available for immediate delivery.—For further particulars, apply to MANAGER, Clynderwen, R.S.O., Carmarthenshire. [Advt.]

MICHELMORE & REAP,
Manufacturers of
CHARLES COLLINGE'S PATENT
COLLINGE'S PATENT HINGES,
LEVER, SCREW, & BARREL BOLTS,
Self-Acting "FALL DOWN" GATE STOPS,
and IMPROVED GATE FITTINGS of every Description.
Discount to Builders. Illustrated List two stamps.
36A, BOROUGH ROAD, LONDON, S.E.

ZINC ROOFING.
CORRUGATED IRON ROOFING.

ESTIMATES FOR ABOVE, EITHER PREPARED READY FOR FIXING, OR FIXED COMPLETE, ON APPLICATION TO

TREGGON & CO.

(The oldest Firm in the Trade, Mr. H. Treggon having been the first to introduce Zinc Roofing in this country),

YORK WORKS, BREWERY ROAD, LONDON, N.
AND 23, JEWIN STREET, E.C.